Two Generations of Crime:

The Intergenerational Transmission of Criminal Convictions over the Life Course

Van de Rakt, M.G.A.

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Two Generations of Crime:

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Marieke Gerdine Anne van de Rakt
geboren op 11 april 1981
te Nijmegen

Promotores:	Prof. dr. Nan Dirk de Graaf	(Nuffield College, Oxford)
	Prof. dr. Paul Nieuwbeerta	(Universiteit Leiden)
Copromotor:	Dr. Stijn Ruiter	(NSCR)
Manuscriptcommissie:	Prof. dr. Rutger Engels	(voorzitter)
	Prof. dr. Catrien Bijleveld	(Vrije Universiteit Amsterdam)
	Dr. René Veenstra	(Rijksuniversiteit Groningen)

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Marieke van de Rakt, november 2010

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Introduction

1.1 Background

Does criminal behavior of fathers lead to criminal behavior of their children? Do the children of offenders commit more crimes in the years after their fathers were convicted of a criminal act? What happens to the criminality of children when fathers are imprisoned? This study investigates one of the most important plausible causes of criminal behavior: the criminal behavior of the father.

Previous research has shown the importance of fathers in predicting the criminal behavior of children (e.g. Hirschi, 1969; Farrington, Barnes & Lambert, 1996; Warr, 1993). However, studies of the influence of fathers on children's criminal behavior tend to focus on the parents as a preventative factor, mostly using the perspective of social control theory (Hirschi, 1969). This theory expects individuals to refrain from committing crimes so as not to jeopardize their relationship with their parents. Children's strong attachment with their parents combined with the supervision parents provide explains the lack of delinquent behavior among children (Aseltine, 1995; Warr, 1993). In some cases, however, having a strong bond with one's father could in fact lead to a higher chance of committing a criminal act. Research shows that the children of criminal fathers are much more likely to commit a crime themselves (Farrington, Lambert & West, 1998; Besjes & Van Gaalen, 2008).

Empirically the relationship between a father's criminal behavior and criminal behavior of his children is well established. The larger part of this research, however, remains descriptive and focuses on cross-sectional relations between the criminal acts of fathers and those of their children. Rowe & Farrington (1997), for instance, reveal a correlation of 0.43 between the criminal convictions of children and their fathers. According to Thornberry et al. (2003), delinquent behavior of parents directly influences the delinquent behavior of children. Other studies show similar results.

Nonetheless, the empirical studies done so far face substantial shortcomings. First, most studies use small samples and retrospective designs. Second, the studies do not analyze the influence of paternal criminal behavior after adolescence. Third, most studies focus on sons and neglect the influence of paternal criminality on daughters. Fourth, most studies lack a comparable control group. Finally, although explanations for the transmission of criminal behavior are suggested, the studies neglect to consistently test criminological theories.

In this study, we investigate the intergenerational transmission of convictions. We improve on the drawbacks of previous studies in five ways. First, we use a large and prospective sample. Second, we investigate the influence of paternal offending on complete criminal life courses, from childhood until adulthood. This allows us to establish the intergenerational transmission of convictions well into maturity. Third, we investigate

daughters as well as sons. Fourth, we analyze both criminal fathers and non-criminal fathers, as well as criminal children and non-criminal children. Finally, we explicitly deduce and test hypotheses from criminological theories.

We first analyze the extent of the intergenerational transmission of criminal behavior by focusing on the relationship between the criminal convictions of fathers and the criminal convictions of their sons and daughters. Using a longitudinal, life-course perspective, we investigate development of the complete criminal careers of both parents and children. In doing so, we adopt a broad interpretation of intergenerational transmission, focusing on various aspects of paternal criminality. Specifically, we explore four aspects of intergenerational transmission: (1) the influence of the timing of criminal convictions of fathers, (2) the influence of parental divorce, (3) the influence of paternal imprisonment and (4) the influence of criminal convictions of mothers and siblings. Our data contains information on all recorded offences committed from age 12 onwards. We use only those cases that were followed by a conviction.

Crime debates dominate public and political agendas, and societies are demanding better understanding of the causes and correlates of crime. Yet in order to make crime prevention programs more effective, knowledge is needed about the influences of paternal criminal behavior. The study presented in this thesis contributes to knowledge about the influences of the nuclear family on the development of criminal behavior. Our focus on the development of criminal careers over time provides insights into the causal order and the timing of influences of paternal criminal behavior. These insights could be helpful for policymakers in designing crime prevention programs.

1.2 Previous research on intergenerational transmission

Research on the topic of intergenerational transmission of criminal convictions is scarce. However, there are some studies (both in the Netherlands and abroad) that explicitly focus on the transmission of criminal behavior between generations. Table 1.1 presents an overview of these studies since 1980.[1]

[1] These studies were found by searching the Social Science Citation Index, Picarta and Criminal Justice Abstracts. Studies investigating the transmission of incest (i.e. Dunlap, Golup, Johnson & Wesley, 2002) and the transmission of aggression (e.g. Conger, Neppl, Kim and Scaramella, 2003) remain outside the scope of our research.

Research in the Netherlands

Some older studies in the Netherlands link the influence of criminal behavior of family members to the behavior of related individuals. For example, Jens (1940) described 10 families from various neighborhoods in Utrecht and found that the criminal behavior of sons is connected to the criminal behavior of their fathers (Jens, 1940). While this study provided valuable insights, it did not systematically analyze the extent of parental and offspring criminality. It was thus unable to show the extent to which criminal behavior is correlated over generations.

After the Second World War, Dutch criminological research mostly focused on societal influences on criminal behavior; and empirical research into the causes of criminal behavior among individuals was scarce. Those studies that were available were mainly theoretical and philosophical (Junger-Tas & Junger, 2007). This corresponded with the spirit of the age. In the postwar period, the Dutch penal system developed into the most humane in Europe, and the Netherlands boasted the lowest level of (registered) crime worldwide in the 1970s (Downes & Van Swaaningen, 2007; Franke, 2007). Rehabilitation was the leading principle of prison sentencing (Boone, 2007). After approximately 1985, the trend reversed and the amount of crime as well as the number of prisoners in the Netherlands rapidly rose. In this period, empirical criminological research also gained momentum.

The main cause of the scarcity of research on intergenerational continuities in criminal behavior in the Netherlands, however, has been the lack of appropriate data. Indeed, the data requirements are daunting for investigating the relationship between parental criminal behavior and that of their offspring. First, a longitudinal study is needed that provides information on the development of criminal behavior of parents as well as of their children. Second, a prospective design is needed, since one should preferably not select upon the dependent variable (in this case, criminal behavior of the children). Such selection could lead to an overestimation of the influence of the criminal behavior of parents on children's behavior. Third, while using a prospective design, convicted as well as non-convicted parents should be included in order to establish the extent to which crime is transmitted. Fourth, a very long period of observation is required in order to analyze both generations into their adulthood (a time span of at least 30 years). Such data have simply not been available in the past. However, at the beginning of the new millennium, several Dutch criminologists addressed the question of whether there is intergenerational transmission of criminal behavior in the Netherlands, each applying a different research focus and each using different datasets.

Three recent Dutch studies in the field of intergenerational continuity of criminal behavior are important. Besjes and Van Gaalen (2008) analyzed an impressive amount of

data considering the entire Dutch population. Their results show that 1 in 12 young adults (18-22 years old) grow up in a family with at least one criminal parent. According to Besjes and Van Gaalen, there exists considerable intergenerational transmission of crime. If a parent commits several criminal acts, children are about 6 times more likely to commit crime, compared to children whose fathers did not commit a criminal act. The risk is increased even more if the delinquent parent is the mother, if the child lives in the same house as the delinquent parent, and if the delinquent acts of the parent are more serious.

The second Dutch study focusing on intergenerational transmission of crime was executed by Bijleveld and Wijkman (2009). They analyzed conviction data on five generations spanning the years 1882-2007. The starting point was a historic, high-risk sample of 198 young men who were placed in a reform school in the Netherlands in the early 1900s. The parents of these 198 men as well as three subsequent generations were traced using Dutch genealogical and municipal records. The results show that parental convictions increased the risk of offspring convictions in all generations. In the last generation, there were still many more children with criminal records than one would expect in the general population. If parental convictions were more serious, the risk of the children committing crime increased more. Bijleveld and Wijkman argue that parental convictions committed before birth do not lead to higher chances for children to commit crime.

The third recent Dutch study investigating intergenerational continuity in criminal behavior was executed by Nijhof, Engels, Wientjes and De Kemp (2007). They collected information on 577 juvenile offenders and their parents. Their results also show that the frequency of parental offending is related to the frequency of criminal behavior among children. Yet, because this study only looks at the behavior of very young children, the extent to which parental offending is related to the behavior of older children could not be established.

Although these Dutch studies and others have produced valuable insights, none has been able to investigate the influence of paternal criminal behavior during childhood, adolescence and into adulthood. Also, the designs of the three studies mentioned above had several drawbacks, which we improve upon in the current research.

International research

Numerous international scholars (e.g. Farrington et al., 1996; Thornberry et al., 2005) have noted that research on the intergenerational transmission of crime is very limited. Hence, this situation is by no means specific to criminology in the Netherlands. Farrington et al. (1996) point to the training of American criminologists as a possible

cause. According to Farrington, criminology's close historical ties to the discipline of sociology could have steered American criminologists away from research having anything to do with possible biological causes of human behavior. Beyond this, before the 1990s, large-scale high-quality datasets appropriate for investigating intergenerational continuity of criminal behavior were simply unavailable.

As in the Netherlands, international research on the transmission of criminal behavior between generations has some historic predecessors. In 1874 Richard Dugdale found six members of the same family in a US county jail. He decided to trace back several generations of the family and found a history of poverty, disease and crime (Dugdale, 1884). Other, also classic studies found similar results (Glueck & Glueck, 1950; McCord, 1977). More recent studies using larger and nationally representative samples focus explicitly on continuities of criminal behavior from parents to children.

Several international studies use different datasets and measurements, but all show similar results. In the Chicago Youth Development Study, Gorman-Smith et al. (1998) found that persistent delinquents are more likely to originate from families with deviant conduct. Results of the Pittsburgh Youth Study (Farrington et al., 2001) show a similar pattern. Sampson & Laub (1993) revealed a substantial association between the criminal behavior of fathers and that of their offspring in an analysis of Glueck & Glueck's (1950) data. Findings of the Oregon Youth Study show gender-specific pathways of transmission of externalizing behavior. Fathers have a larger influence on daughters than on sons (Kim et al., 2009). A recent study by Giordano (2010), focusing on paternal and maternal criminal behavior, also shows a larger chance of criminal behavior among children of criminal parents. In sum, international studies consistently find a strong association between criminal behavior of parents and that of their children.

An important investigation of the intergenerational transmission of criminal behavior is the Rochester Youth Development Study (also known as the Rochester Intergenerational Study). This prospective, longitudinal study began in 1988 to follow 1,000 adolescents, along with their parents and, over time, their children. The study, being executed by Terence P. Thornberry, has consistently shown that intergenerational transmission of antisocial behavior is modest, but evident. Parents' antisocial behavior leads to aggression in young children (Thornberry et al., 2003; 2009) and results in delinquent and criminal behavior as children grow older (Thornberry, 2005).

Research on intergenerational continuities has also appeared outside of the United States. The most important and influential study appeared in London: the Cambridge Study in Delinquent Development (CSDD). This study, initially executed by Donald J. West and nowadays by David P. Farrington, follows a population of 411 London boys and their families through surveys and with the collection of official data.

Various scholars have used the CSDD data to investigate questions concerning intergenerational transmission. For instance, Rowe and Farrington (1997) show a direct effect of parental convictions on children's criminal behavior. This relation is strong too, with the study reporting a correlation of 0.43 between convictions of sons and fathers (Rowe & Farrington, 1997). The CSDD data also show that the criminal careers of children resemble those of their fathers, but that careers of older generations seem to be longer than careers of younger generations (Farrington, Lambert & West, 1998). However, the delinquent acts of younger generations follow one another more quickly than those of older generations.

Summarizing, research from the Netherlands as well as international findings show substantial (but varying) influences of parental criminal behavior on the behavior of offspring. Table 1.1 presents an overview of all of the studies since 1980.

Limitations of previous research

The results of the previous studies have greatly contributed to knowledge about the intergenerational transmission of criminal behavior. Especially valuable are the insights from the Rochester Intergenerational Study and the Cambridge Study in Delinquent Development. However, the designs of all of these studies have limitations. First, many of these studies use relatively small datasets, which precludes the use of advanced statistical tests. Second, most studies employ limited follow-up periods and neglect analysis of the effects of parental criminal behavior on the behavior of adult offspring. Most studies, therefore, focus on cross-sectional relations instead of developments and changes in criminal careers over time. Finally, several of the studies select respondents on the dependent variable (criminal behavior of the child), which results in an overestimation of intergenerational continuity. In other cases, a comparable control group is lacking. All previous studies exhibit at least one of these shortcomings. To improve on all of these drawbacks, we apply a unique, large, prospective dataset with 3,500 fathers and 8,000 children over a period of 30 years.

Table 1.1: Overview of studies of intergenerational transmission of criminal behavior since 1980 (retrospective studies)

Authors	Year	Dataset	N	Measurement	Selection
Retrospective					
Hagan & Palloni	1990	Cambridge Study in Delinquent Development (London)	218 research subjects and their fathers	Self report & official reports	Convicted and non convicted boys
Sampson & Laub	1993	Unraveling juvenile delinquency (Gluecks) (Boston)	480 research subjects and their fathers	Self-report & official reports	Convicted and non convicted boys
Rowe & Farrington	1997	Cambridge Study in Delinquent Development (London)	344 research subjects, parents and siblings	Self-report & official reports	Convicted and non convicted boys
Gorman-Smith et al	1998	Chicago Youth Development Study (Chicago)	288 research subjects and their parents	Self report	5th and 7th grade students
Farrington et al.	1998	Cambridge Study in Delinquent Development (London)	411 respondents and their fathers	Official reports	Convicted and non convicted boys
Farrington et al.	2001	Pittsburgh Youth Study (Pittsburgh)	1395 research subjects, parents and siblings	Self report	Samples of 1e , 4e and 7e years students (boys)
Jaffee et al.	2003	Environmental Risk Longitudinal Twin Study(England & Wales)	1116 twins and their parents	Self-report	Sample of twins, more high-risk families
Nijhof et al.	2007	Regional police data (the Netherlands)	577 research subjects (8-14 years old) and their parents	Official reports	Selection of juvenile offenders

Table 1.1 (continued): Overview of studies of intergenerational transmission of criminal behavior since 1980 (prospective studies)

Authors	Year	Dataset	N	Measurement	Selection
Prospective					
Farrington et al	1996	Cambridge Study in Delinquent Development (London)	397 research subjects, parents and siblings	Official reports	Convicted and non convicted boys
Thornberry et al	2003	Rochester Youth Development Study (New York)	109 fathers, 111 mothers, 296 children (Max. 10 year old)	Self-report Reports of partner	Selection of students of public schools (7e and 8e grade)
Smith & Farrington	2004	Cambridge Study in Delinquent Development (London)	408 grandfathers, 178 fathers 322 children (Max. 15 years old)	Self-report & official reports	Convicted and non convicted boys
Thornberry	2005	Rochester Youth Development Study (New York)	109 fathers, 111 mothers, 296 children (Max. 15 years old)	Self-report Report of partner	Selection of students of public schools (7e and 8e grade)
Kim et al.	2009	Oregon Youth Study (Pacific North-West)	206 fathers, mothers, children& grandparents (3 generations)	Self-report & official reports	Selection of 4th grade students from schools in high-crime areas
Thornberry et al.	2009	Rochester Intergenerational Study (New York)	276 fathers, 148 mothers and children (Max. 19 years old)	Self-report	Selection of students of public schools (7e and 8e grade)
Besjes & Van Gaalen	2008	CBS data entire Dutch Population (the Netherlands)	All Dutch persons between 18-22 (94.000)	Official reports	Selection of small part life course (1999-2005)
Bijleveld & Wijkman	2009	5 generation study (the Netherlands)	198 children, their parents and 3 generation off-spring	Official reports	Selection of adolescent males in reform school
Giordano	2010	Ohio Life-Course Study	Sample of 127 girls aged 16 in 1982 and biological children (n=158)	Self-report	Delinquent girls (population of the state institution of delinquent girls in Ohio)

1.3 General theoretical insights

In order to test possible explanations for the intergenerational transmission of convictions, we use insights from various criminological theories. In this section, we first introduce six explanations of intergenerational transmission as distinguished by Farrington (Farrington, et al., 2001). We then discuss developmental criminological theories. These theories are generally used to explain the development of criminal careers, but we apply them to deduce predictions about the intergenerational transmission of convictions. With this application, we advance theory in two ways. First, we apply established theories to a new setting, resulting in a more stringent testing of the theoretical assumptions and predictions. Second, we formulate contradicting hypotheses, allowing theories to be tested against one another.

Intergenerational continuity: six mechanisms

Intuitively, one assumes a relation between criminal behavior of parents and children. Virtually all criminological theories too make this prediction. However, the explanations for the relationship vary. Farrington et al. (2001) distinguish six explanations for intergenerational resemblance. The first is that criminal behavior is only a small part of the transmitted behavior. A variety of undesirable behaviors, such as poverty, teenage pregnancy and living in deprived neighborhoods is transmitted from one generation to the next. Farrington et al. refer to this as the 'cycle of deprivation'. An undefined trait is said to be responsible for these undesirable behaviors. This undefined trait is transmitted from parents to children. The second explanation emphasizes the mechanism of 'assortative mating'. This is to say, men with a criminal history are more likely to marry and procreate with women who also have a criminal history. These women are less fit to raise children, putting their children at risk and increasing the chance of their children themselves becoming involved in crime. The third explanation for intergenerational transmission is imitation. Quite simply, children learn criminal behavior by observing and modeling the behavior of their parents. The fourth explanation points to a genetic cause. Criminal parents may have some genetic predisposition for criminal behavior, a predisposition that is then transmitted from one generation to the next. The fifth mechanism is environmental: Criminal parents tend to live and raise their children in the least favorable social environments, which increases the children's chances of criminal behavior. The sixth and final mechanism suggests that some families are monitored more intensively by law enforcement because of an official bias towards known criminal families. This is somewhat like the process of 'labeling', by which children born to criminal fathers have a higher chance of perceiving themselves as criminals, resulting in a

self-fulfilling prophecy in the commission of crimes (Rowe and Farrington, 1997). Of course, the mechanisms do not exclude one another.

Developmental criminological theories

While previous research has mostly focused on establishing cross-sectional associations between paternal and offspring criminality, in this study, we look explicitly at the influence of criminal convictions of fathers on the *development* of criminal careers among their children. This focus on the development of criminal careers allows new questions to be asked about the influences of paternal convictions on changes in individual life courses. As the research questions in this study are different from those previously posed about intergenerational transmission, our theoretical focus is different as well. Although the six mechanisms of Farrington et al. (2001) provide useful insights into the association between paternal and offspring criminality, the mechanisms do not lead to explicit expectations about the influences of paternal criminal behavior on the *development* of criminal careers of children. Theories centered on the development of criminal behavior over the life course would therefore be more appropriate.

Hence, our theoretical framework consists mainly of insights from developmental criminological theories. These theories are commonly used to explain changes in criminal careers within one generation (intragenerational continuity). Here, we apply these developmental theories to explain changes in the criminal careers of two successive generations. Applying these established theories to a new setting will lead to theoretical predictions about the influences of paternal criminal behavior on the development of criminal careers of children. This application should advance theory, since we will be able to test whether the assumptions and predictions of the established developmental theories still count when stretched to the intergenerational setting. This does not imply that we will bypass the mechanisms proposed by Farrington. On the contrary, elements from these can be incorporated into the developmental theories.

The tradition of intragenerational continuity views crime as one of many developmental trajectories one commences during the course of one's life. Important transitions in the life span, like getting married and entering the labor market, influence developments in other domains, like crime (e.g. Bushway, Brame & Paternoster, 2003; Laub & Sampson, 2003; Blokland & Nieuwbeerta, 2006). Here, two paradigms can be distinguished. Each is subscribed to by a group of developmental criminological theories making comparable assumptions about the origin and development of crime over the life course. We derive hypotheses from both positions and test their plausibility.

The first paradigm consists of a group of criminological theories which assume that people differ in their propensity to commit crime. The literature often refers to this

position as 'population heterogeneity' (Nagin & Paternoster, 1991) or 'persistent heterogeneity' (Piquero, Farrington & Blumstein, 2003). According to this view, each individual has a certain chance to commit crime, and differences between individuals in this chance are due to personality traits and biological causes (Wilson & Hernstein, 1985) or to differences in upbringing (Gottfredson & Hirschi, 1990). Theories in this tradition are often referred to as 'static theories'. In short, static theories view some people as more prone to criminal behavior than others. Wilson and Herrnstein (1985), for example, propose that criminal behavior is caused by biological personality traits and constitutional factors. Gottfredson's and Hirschi's self-control theory (1990) states that people differ in self-control and that people with little self-control have a higher chance of committing crime. Hirschi and Gottfredson assume that self-control remains stable from childhood until adulthood. Of the mechanisms proposed by Farrington, the 'cycle of deprivation' and the genetic cause are most compatible with the assumption of population heterogeneity and thus can be seen as static explanations of crime.

The second paradigm consists of a group of developmental criminological theories which state that the tendency to commit crime changes during the life course. This perspective is often referred to as 'state dependence' (Nagin & Paternoster, 1991), meaning that life circumstances influence one's chance of committing crime and that there exists a causal relation between past and future criminal behavior. Conventional behavior like graduating from school and entering the labor market diminish one's chance of committing crime, while having delinquent friends increases one's chance of criminal activity (Sampson & Laub, 1990; 1993). Explanations within this tradition are referred to as 'dynamic theories'. The most important dynamic theory is the age-graded theory of informal social control of Sampson and Laub. According to this theory, changes in bonds with education, family and work can either enhance or diminish one's chance of committing crime (Laub, Nagin & Sampson, 1998). For instance, losing a job increases one's chance of committing crime, while finishing an education diminishes one's chance. Recent studies with data from the Criminal Career and Life Course Study executed by Blokland & Nieuwbeerta (2005) confirm that life changes like getting married and having children influence the development of one's criminal career. After a person gets married and has children, his or her chance of conviction is lower. Of the mechanisms mentioned by Farrington, imitation, social environment, labeling and official bias are all compatible with the assumption of state dependence. They thus can be seen as dynamic explanations of crime.

1.4 Theoretical predictions

In order to make theoretical progress, we formulate competing hypotheses. To do so, we use the main assumptions of the static theories (population heterogeneity) and of dynamic theories (state dependence) to derive contrasting hypotheses about the extent to which criminal behavior is intergenerationally transmitted. In order to bring the two paradigms in opposition to one another, we interpret the theories very narrowly, staying rather close to their original formulations. This results in extreme formulations of the predictions of both paradigms and a strict testing of the key assumptions.

Static theories: predictions

Static theories assert that population heterogeneity is the only process that accounts for the differences in people's chances of committing a crime. Applied to the intergenerational perspective, static theories thus state that the chance of a child committing a crime is not causally influenced by the number of criminal acts the father commits. Static theories would claim that the relation between criminal convictions of fathers and the convictions of children are spurious. Both the criminal behavior of parents and the criminal behavior of children is caused by some other mechanism (i.e., factors other than simply the criminal behavior of fathers). Wilson & Hernstein (1985) formulated a static mechanism in their book Crime and Human Nature, proposing that criminal behavior is caused by personality traits and constitutional factors and is transmitted in early childhood.

One of the most tested and used static theories is Gottfredson and Hirschi's self-control theory, which holds that criminal behavior (of both parents and children) is entirely caused by a lack of self-control. According to the self-control theory, people who have little self-control display risk-taking behavior, are short-sighted and aim at immediate gratification (Gottfredson & Hirschi, 1990). These characteristics are part of a larger whole of unadjusted behavior. Inadequate parenting in early childhood is deemed responsible for such unadjusted behavior. Children whose parents do not consistently monitor, correct and punish their behavior are more likely to develop low levels of self-control. According to the self-control theory, parents are unlikely to encourage their children to commit crimes, regardless of their own criminal history. However, criminal parents themselves have little self-control. Their own behavior is oriented towards immediate gain, and they are thus less likely to pass on the skills of self-discipline and delayed gratification to their children. These parents are therefore less successful in bringing up their children. They furthermore are less likely to recognize criminal behavior in their children, and tend to correct and punish less consistently. This results in children

with little self-control. Hence, parents with little self-control (and many convictions) have children with little self-control (and many convictions).

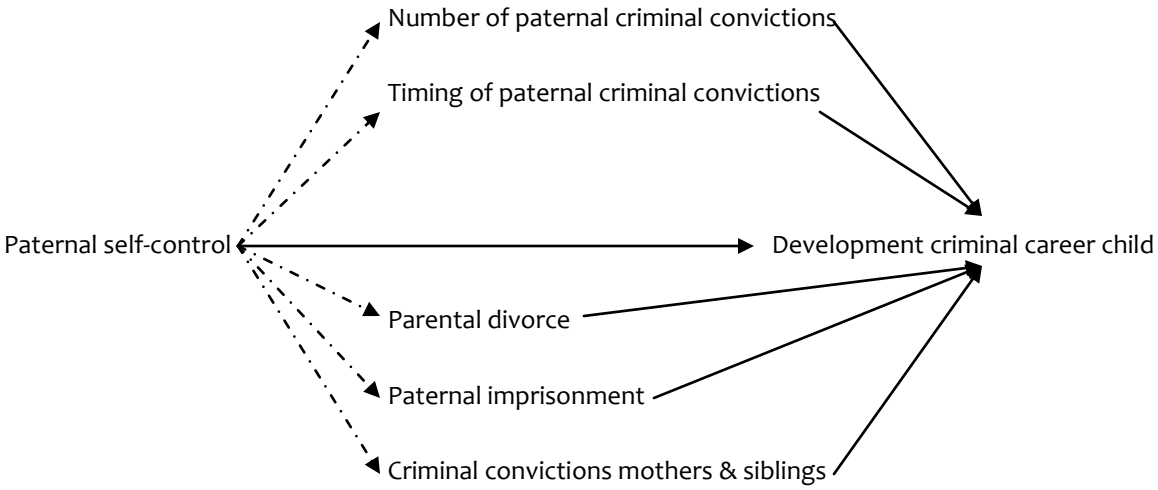
According to Gottfredson and Hirschi, self-control remains stable after childhood, and persons with little self-control have a higher chance of committing crime under all conditions, in every phase in their lives. The window of development of self-control is rather short. Gottfredson & Hirschi (1990; 109) state, 'the level of self control distinguishes offenders from nonoffenders and the degree of its presence can be established before criminal acts have been committed'. No explicit age is mentioned in their work, although there are references to preadolescence, in the early years of life and early adolescence. This study assumes that an individual's level of self-control remains stable after the age of 12.

According to Gottfredson & Hirschi, parents' self-control is the only cause of differences in children's self-control and thus of differences in criminal behavior among children. The association between the criminal behavior of fathers and their children is spurious and caused by similarities in self-control. Life circumstances, like parental divorce and paternal imprisonment, would not directly influence children's development of criminal behavior. In figure 1.1, the dashed arrows represent the main predictions of the self-control theory concerning intergenerational transmission. According to the theory, all of the associations analyzed in this study are the result of differences in self-control. There is no causal influence of the timing of paternal convictions, parental divorce, paternal imprisonment or maternal and sibling criminality.

Dynamic theories: predictions

Dynamic theories hold that individuals' propensity to commit crime changes during the life course. This does not mean there is no room for population heterogeneity. Rather, the dynamic perspective holds that beyond individual differences, life events too can affect criminal inclinations. Previous research showed that both heterogeneity effects and life changes are important (Nagin & Paternoster, 2000). Applied to the intergenerational transmission of crime, dynamic theories predict that the criminal behavior of parents causally influences the criminal behavior of their children. In this study, two dynamic theories are central: the differential association theory (Sutherland, Cressey & Luckenbill, 1992) and the age-graded theory of informal social control (Sampson & Laub, 1990; 1993).

Figure 1.1: Predictions from static and dynamic theories of crime



Dashed arrows represent the predictions of static theories. Paternal self-control influences an individual's development of a criminal career (via their self-control). Paternal self-control also explains all of the indicators of intergenerational transmission: the number of parental criminal convictions, the timing of paternal criminal convictions, parental divorce, paternal imprisonment and maternal and sibling convictions. According to the self-control theory, these indicators *do not* influence the development of criminal careers of children.

Solid arrows represent the predictions of the dynamic theories. According to dynamic theories, the number of parental criminal convictions, the timing of paternal criminal convictions, parental divorce, paternal imprisonment and maternal and sibling convictions *do* influence the development of a criminal career.

The differential association theory or 'learning theory' suggests that criminal behavior is taught in the same manner as normal (accepted) behavior is taught. Thus, the largest part of the learning of criminal behavior takes place in intimate personal groups, such as the family. Individuals can be taught not only the techniques they must master to commit crime, but motives, values and attitudes towards crime can also be learned. Association with delinquents then causally leads to a higher chance of learning and committing crime (e.g. Sutherland, Cressey & Luckenbill, 1992; Akers & Jensen, 2003). Association with criminal fathers, who are role models for their children, is an especially influential determinant of children's criminal behavior.

According to learning theories, the timing of the father's criminal convictions is important too. In the years following a paternal criminal conviction, children will have a higher chance of committing a crime. Also, association with criminal mothers and siblings would influence criminal behavior of children. Also, according to dynamic theories as the age graded theory of informal social control (Sampson & Laub, 1990; 1993), parental divorce and paternal imprisonment lead to a breakdown of the parental bonds, which would likely enhance the chances for children to develop a criminal career. According to dynamic theories, there are causal influences of the number and the timing of paternal convictions, of parental divorce, of paternal imprisonment and of criminal convictions of mothers and siblings.

With the current research, we aim to confirm either the insights of the static theories (represented by the dashed arrows in Figure 1.1) or the insights of the dynamic theories (represented by the solid arrows in Figure 1.1).

1.5 This thesis

In this thesis, we aim to answer two central research questions. We first explore the association between criminal convictions of fathers and criminal convictions of their children. We do so by replicating the analyses executed in previous research using more appropriate data and techniques. Furthermore, we improve upon previous research by studying the intergenerational transmission of criminal behavior from a longitudinal perspective. The results thus provide insights into the transmission of convictions over the life span. The first central question of this study is '*to what extent do paternal criminal convictions affect the development of criminal convictions of children over the life course'.*

This study interprets 'intergenerational transmission' broadly, focusing on various aspects of paternal criminality. The second step of this study therefore consists of an analysis of a variety of aspects of paternal criminality. This broad interpretation of intergenerational transmission has several advantages. First, it enables us to introduce

new research questions. Second, the investigation of multiple aspects of the intergenerational transmission of convictions should produce more nuanced and detailed insights. Third, focusing on different aspects of the intergenerational transmission of crime enables us to deduce and test more predictions from criminological theories. The broader view also allows us to test criminological theories against each other. We investigate the intergenerational transmission of convictions by analyzing the exact timing of paternal convictions, paternal imprisonment, parental divorce and the influences of maternal and sibling criminality. The second central question of this thesis therefore reads '*to what extent do (a) the timing of paternal criminal convictions, (b) parental divorce, (c) paternal imprisonment and (d) maternal and sibling criminality explain the development of criminal careers of individuals over the life course*'.

By addressing these research questions, we hope to contribute to scientific progress in a number of respects. First, we introduce new research topics (e.g. the influence of the timing of paternal convictions) as we focus on the *development* of criminal careers of children. Second, we apply theories designed to explain developments of criminal behavior over the life course to a new setting: the intergenerational transmission of crime. This results in more stringent testing of the established theories. Third, we use a new rich dataset. We analyze data from the Dutch Criminal Career and Life Course Study (CCLS). This is an administrative, prospective, longitudinal sample of 3,500 fathers and 8,000 sons and daughters, containing both criminal and non-criminal fathers and children. These data allow us to establish the development of criminal careers of children from their 12th through their 40th birthday. Fourth, we make scientific progress by using advanced statistical techniques. We apply trajectory analysis, multilevel models and fixed effect panel models to answer our research questions accurately, while previous studies relied on less sophisticated and less reliable analytic strategies.

Outline of the thesis

This thesis discusses various aspects of the investigation of the intergenerational transmission of convictions. Chapter 2 focuses on the process of data collection of the Criminal Career and Life Course Study (CCLS). For the purpose of this research, the CCLS used by Nieuwbeerta & Blokland (2003) is extended. The chapter provides a detailed description of data collection, the research population and the analytic strategies.

In chapter 3 the extent of the association between paternal convictions and the convictions of children is estimated using both cross-sectional and longitudinal measurements. Our intention here is to answer the first central question of this thesis. In order to do so, we pose two sub-questions: *To what extent does intergenerational*

transmission of convictions exist? And, *To what extent do criminal careers of children differ between those with non-criminal fathers and those with fathers belonging to a group of persistent recidivists?* We investigate (1) differences between the criminal careers of children from the different groups of fathers and (2) differences within each group of children in the development of their individual criminal careers. In the following chapters, other aspects of the intergenerational association are discussed, which will provide an answer to the second central question of this thesis.

In chapter 4, a first attempt is made to explain differences between children in the development of criminal behavior. For this purpose, predictions of static and dynamic theories are tested against one another. The timing of convictions of the father relative to the development of criminal behavior of children is central in this chapter. We investigate whether children have a higher chance of committing crime in the years following a conviction of the father. The two sub-questions posed in chapter 4 are the following: *To what extent is the intergenerational transmission of convictions dependent upon the timing of criminal acts of fathers?* And, *To what extent do static and dynamic theories explain the intergenerational transmission of convictions?*

Chapter 5 investigates the influence of parental divorce on the development of individual criminal careers. We look explicitly at the causal influence of divorce and at the influence of divorce in criminal and non-criminal families. Previous studies show an enlarged chance of committing crime among children with divorced parents (e.g. Haas, Farrington & Sattar, 2004; Wells & Rankin, 1991). Also, research indicates that effects of parental divorce are different in criminal and non-criminal families (e.g. Jaffee, Caspi & Taylor, 2003). The questions posed in this chapter are as follows: *To what extent does parental divorce affect the subsequent criminal convictions of individuals?* And, *To what extent does the impact of parental divorce depend on the criminal convictions of fathers?*

In chapter 6, we investigate another aspect of the relation between the criminal behavior of fathers and children. Previous studies indicate that having a father in prison leads to higher a chance for children to commit crime (Murray & Farrington, 2005; Murray, Janson & Farrington, 2007). Little is known, however, about the influence of parental imprisonment on the development of criminal behavior into adulthood. The question is then posed: *What is the long-term effect of paternal imprisonment on the development of criminal behavior of children?* We focus on the timing and the duration of the paternal imprisonment.

Chapter 7, the final empirical chapter, investigates the influence of convictions of other family members (mothers and siblings). In this chapter, we also study the extent to which the transmission of criminal convictions of fathers to their children can be explained by the criminal convictions of mothers and siblings. The following question is posed: *To what extent do convictions of (a) mothers and (b) siblings explain the relation*

between criminal convictions of fathers and the development of criminal careers of the children?

The final chapter summarizes the findings from the empirical chapters and draws conclusions about the influence of the criminal convictions of fathers on their children's development of criminal behavior. We compare the support found for the static theories, on the one hand, with that found for the dynamic theories, on the other hand. Also, the limitations of this study are addressed and some suggestions are made for theoretical improvement, future research and policy.

Chapter 2

Criminal Career and Life course Study

2.1 Introduction

In order to study the topic of intergenerational continuity in criminal behavior and to answer the central research questions of this thesis, we use data from the Dutch Criminal Career and Life Course Study (CCLS). Previous research with data of the CCLS focused on the development of criminal careers of a cohort of over 5,000 persons convicted in 1977 in the Netherlands (Blokland, 2005; Nieuwbeerta & Blokland, 2003). Research analyzed the influence of life circumstances (like work and marriage) on the development of criminal behavior over time (Blokland & Nieuwbeerta, 2005; Bersani, Nieuwbeerta & Laub, 2009; Blokland, Nagin & Nieuwbeerta, 2005). Static and dynamic theories of crime were tested. Findings are in line with static as well as dynamic theories, with slightly more evidence for the latter. Marriage and prior offending appeared to be more important for the development of criminal careers than criminal propensities (Blokland, 2005; Nieuwbeerta, Blokland & Nagin, 2009).

In this thesis, we will use information from the same Criminal Career and Life Course Study. As this thesis focuses on the intergenerational transmission of convictions, additional data had to be collected. We collected information about all children of the CCLS research subjects. This has resulted in a longitudinal, prospective dataset covering 3,500 fathers and about 8,000 children. The major emphasis in this thesis will be on the convictions of fathers rather than on the convictions of mothers. The reason for this is mostly pragmatic; fathers commit much more crime than mothers do. We will, however, pay explicit attention to the influence of maternal convictions and to the convictions of siblings in chapter 7.

In this chapter, we will first describe the process of the data-collection of the original Criminal Career and Life Course Study. After that, we will explicitly focus on the data-collection of the complementary data, collected specifically for this thesis (CCLS children). After describing the process of data-collection, we will introduce the measurements we will use. Following, we will reflect on both the strengths and the limitations of the CCLS. Finally, we will give a description of the analytic strategies we will use in this thesis.

2.2 The CCLS

The information used in this thesis is coming from two sources. The first source contains information from the General Documentation (GDF) of the Dutch Criminal Records Office. These files provide the information about the criminal convictions. Our second course consists of information from Population Registration Data. These data contain information about life course circumstances and changes.

Phase I: The 1977 Recidivism Sample

Starting point of the CCLS is the 1977 Recidivism sample. The Recidivism sample was collected by Block and Van der Werff (1986). The data contain information on a representative sample of 4 % of all cases of criminal offences that were tried in the Netherland's in 1977, resulting in a sample of 5,656 individuals (Blokland, 2005; Nieuwbeerta and Blokland , 2003). The criminal acts of offenders committed up until 1983 were collected using extracts from the General Documentation Files (GDF) of the Dutch Criminal Records Office. The GDF contain information on every criminal case registered by the police with the Public Prosecutor's Office and are comparable to the 'rap sheets' which are common in de United States. Results of the Recidivism study show that within 6 years after the year in which people were convicted (1977), 51 % of the sample had been reconvicted at least once (Van der Werff, 1986; Block & Van der Werff, 1991).

Phase II: Updating the 1977 Recidivism Sample: start of the CCLS

In 2003, Blokland and Nieuwbeerta initiated a relaunch of the original 1977 Recidivism study. Blokland and Nieuwbeerta obtained additional information of all the offenders in the 1977 sample. They extended the entire criminal histories of the 5,565 individuals up until 2002. A group of 492 persons was not found in the General Documentation Files, resulting in information about 5,164 individuals. Individual offending rates were measured annually beginning when the offenders were 12 years of age (the minimum age of criminal responsibility in the Netherlands) up to the year 2002. The data therefore contain information on all recorded offences committed from age 12 onwards, encompassing the juvenile and adult criminal career. This information was supplemented with information that normally would not be mentioned due to periods of limitation (Nieuwbeerta & Blokland, 2003).

Phase III: Adding a control group to the CCLS

The CCLS data are unique and well suited to study the development of crime over the life course. Yet an important disadvantage is that, by construction, all of the men in the sample are convicted at least once, that is, in 1977. To overcome this limitation, data of a matched control group consisting of men who were not convicted was collected. While searching military records for purposes that lay outside the scope of this study (Bersani,

Nieuwbeerta and Laub 2009; Van Schellen and Nieuwbeerta, 2007) it was possible to retrieve a randomly selected group of 920 Dutch men born on exactly the same days as the men in the research group. All men in the Netherlands (born before 1978) were approved and tested for military services. The results of these tests were all stored in military archives. The military records of a random subsample of the men in the research group were looked up. Male convicts were matched to a control person by selecting the person with the first following military registration number. This means that convicts and control persons have a similar date of birth and are thus matched on the basis of age. After retrieving their names and births, the criminal histories of these 920 men were completed with the information of the GDF. The data of the GDF showed that 134 men were convicted of at least one criminal act. Within the control group, 134 men thus had a criminal record. The purpose of the control group in this thesis is to have a group of people who were not exposed to a certain stimulus (in this case having a criminal father). For the purpose of this thesis, we therefore decided to exclude the 134 men who had a conviction from the control group. In this way, we will be able to compare children from fathers with different criminal histories with children from a group of fathers who were never convicted. After omitting the 134 convicted men, the control-group consists of 786 non-convicted men.

Phase IV: Extending the CCLS with life course information

Blokland and Nieuwbeerta extended the CCLS in 2003 by obtaining information about the life circumstances of the 5,164 research subjects and of the 786 control persons. Information was retrieved from the population registration data (Gemeentelijke Basis Administratie- GBA). Since 1938 all Dutch citizens are registered in the municipality they live in. The GBA contains information about marriage and getting children, as well as divorce and death. For people who died before 1994, the registration was not made digitally available. For those research objects, personal record cards were retrieved from the Centre of Genealogy and Heraldry (CBG), resulting in the same information as for the people who were found in the GBA. Blokland and Nieuwbeerta found information in the population registration data of 4,615 persons of the 5,146 research subjects. Of these 4,651 persons, 4,271 were men. In this thesis, we will use the information about these 4,271 men. For the control persons, in 96 instances (10.4%) no information persons could be found, reducing the size of the control group to from 786 to 690 men.

Phase V: Extending the CCLS with partner information

The CCLS was also supplemented with data on the complete criminal careers of all of the marriage partners of the research subjects from age 12 to calendar year 2007. With this data the influences of spouses on each other's criminal convictions are analyzed (e.g. Van Schellen, Nieuwbeerta & Poortman, 2008;). The population registration records revealed that 74.5 percent (N = 3,437) of the original 4,615 research subjects married on at least one occasion, to a total of 4,409 partners. The enlargement of the CCLS data allows for the determination of the exact timing of marriage and, for all research subjects and all the partners they were ever married to, the exact timing of criminal offenses, the type of offenses committed, and periods of prison confinement.

Characteristics of the CCLS sample

Table 2.1 shows some characteristics of the 4,271 CCLS men and the 690 control-persons. The results show that the men in the CCLS sample are slightly older (due to our selection of non-criminal control-persons and to differences in findings of population registration data). Also among CCLS men, fewer men have children than among control persons. However, both control persons as well as CCLS sample men have about 2,3 children per father. CCLS men get married less often, but appear to divorce more than control persons. Also, they are married to more spouses on average. CCLS men on average commit 12,5 criminal acts per person and among the CCLS men 46,3 % are imprisoned at least once.

Table 2.1: Characteristics of the CCLS sample (men only) and the control group

	CCLS sample	control group
Number of men	4271	690
Mean age in 2003	55.5	53.6
% Men with children	68.0	76.0
Mean # of children per father (of those with children)	2.33	2.37
% Ever married up to 50	72.0	84.3
% Divorced (of those married)	53.5	21.3
Mean # of partners (of those married)	1.22	1.13
Mean # of convictions	12.5	.0
% Ever imprisoned	46.3	.0

2.3 The CCLS children

For the purpose of this thesis, in which we study the intergenerational transmission of convictions we collected additional data, further expanding the CCLS. This resulted in the collection of the data on the CCLS children. From January 2005 until June 2006, we worked at the data-collection of all children of the CCLS men and the children of the control persons.

CCLS fathers

For the study of the intergenerational transmission we were interested in the men in the CCLS sample and the men in the control group who had children above the age of 12. These research subjects will be the fathers in this study. The selection of the age of 12 is made as children in the Netherlands can only be convicted for their criminal behavior after they have reached the age of 12. The information of the GBA and CBG showed that 3,015 of the 4,271 CCLS men had children above the age of 12. These 3,015 fathers will be the 'criminal fathers' in this study. Of the 690 control men, 485 had children above the age of 12. These 485 men will be the control fathers in our study. The total amount of fathers in this study thus adds up to 3,500 (3,015 criminal fathers and 485 non-criminal fathers).

CCLS children

Population registration data show that the 3,015 CCLS- men fathered 6,921 children that had at least reached the age of 12 by 2005 (the end of our observation period). From the control-group, the 485 men fathered a total of 1,066 children aged at least 12 in 2005. One should note that these children were all 1) born while fathers were married to the mother of the child or 2) acknowledged by the father.

We retrieved the judicial information about the children of the research subjects and the children of the control persons from extracts of the GDF. This happened in the exact same manner as the extracts of the CCLS men and Control persons were obtained. Individual offending rates were measured annually beginning when the offenders were 12 years of age (the minimum age of criminal responsibility in the Netherlands) up to the year 2005. The data therefore contain information on all recorded offences committed from age 12 onwards, encompassing the juvenile and adult criminal career.

For children and control children, we also gathered population registration data from the GBA and the CBG, which contains information about marriage and getting children, as well as divorce and death.

Selective child-bearing

The characteristics of the CCLS sample and the control group in Table 2.1 already show that the number of men within the CCLS sample who did not get children is higher than within the control group. The number of children per father in both groups is about the same. This of course results in relatively more children born in the control group than in the CCLS sample. In Table 2.2, we will look into the extent of selective child-bearing a bit further.

Table 2.2: Child-bearing of CCLS sample and control group

	Criminal convictions CCLS sample/ control group				
	0	1	2-5	5-15	15+
% no children	24.0	24.0	27.4	29.2	39.3
Mean # of children per father	2.3	2.3	2.3	2.2	2.2

The results from Table 2.2 show that as number of criminal convictions of the men in the CCLS sample rises, the percentage of men who do not have any children rises as well. Especially among the men committing more than 15 crimes, the amount of men who do not get any children is high. The number of children per father appears similar among all groups (about 2.3 children per father). As a result of these two processes, less children are born in the groups with the most criminal fathers (especially in the 15+ convictions-group). Part of the intergenerational transmission (or better the lack of intergenerational transmission) already starts with differences in child-bearing. The fact that the most criminal men are more likely to have no children at all, implies that they have on average less chances to transmit their behavior (e.g. via genes, learning, education) to their children than men with no criminal acts.

Characteristics of the CCLS fathers and children

In Table 2.3, some characteristics of the children of the CCLS fathers and of the control fathers are summarized. Most striking result from Table 2.3 is of course the differences in the number of children who ever get convicted and the mean number of convictions between children from CCLS fathers and children from control fathers. Control children have much fewer convictions than children from CCLS fathers. Also, parents of CCLS children get divorced much more often than parents from control children.

Table 2.3: Characteristics of CCLS fathers/ control fathers and their children

	CCLS fathers	control fathers
Fathers		
Number of persons with children at least 12	3015	485
Mean age in 2003	56.9	53.6
Mean number of convictions	10.3	0
Children		
Number of children at least12	6921	1066
Number of boys	3480	562
Number of girls	3441	504
Mean age in 2005	30.9	28.6
% of parents remain married	35	77
Number of convicted children	1966	119
Mean number of convictions	1.8	0.3

2.4 Measurements

Criminal convictions

All information about criminal convictions in this thesis is coming from the General Documentation Files of the Criminal Records Office. The abstracts contain information about all juvenile and adult offences. The extracts from the GDF give information about only those crimes for which an individual has been convicted as well as cases which were terminated because of policy reasons (beleidssepots). Both convictions as terminations because of policy reasons are included in our data. The data in this thesis thus only provide information on offences that have been judicially proven. In order to keep this thesis readable, we will refer to those offences as convictions throughout this thesis.

We exclude non-criminal law offences (traffic and economic offences, for example). The convictions analyzed in this thesis are thus all criminal law offences, ranging from simple theft (e.g. shoplifting) to manslaughter and murder. Part of the information in the GDF (concerning offences committed and prescribed before 1980) was not made digitally available. Information about these offences for the CCLS men was already in the 1977 Recidivism Study. The information of the offences for CCLS children, Control persons and Control children was completed by digitalizing information from microfilm.

Throughout this thesis, we will investigate the influence of different aspects of intergenerational transmission on the development of criminal careers of children. The dependent variable in this thesis is the criminal career of the child. The criminal careers are measured by the number of convictions children have. In some analyses, we will use the total amount of criminal convictions during the entire life of an individual. In most of the analyses, however, we focus on the criminal convictions in a certain year. Individuals

score a 0 in the years in which they do not have a conviction, while individuals score a 1 in the years in which they have 1 or more convictions.

The criminal convictions of fathers are measured in the same way as the criminal convictions of the children. For all fathers a registration is made whether or not they committed a criminal act in a year. In most analyses, we will use a measurement indicating the total amount of criminal acts of a father. The total amount is measured by adding the number of offences a father was convicted for during a certain period of a father's live.

Life Course Information

In this thesis, we will also use life course information of the family, mostly measured through population registration data of the father. These data contain information about birth and death, marriage and divorce and the birth of children. Measurements used in this thesis are the number of children within a family (measured by the total number of children of a father, also including children younger than 12) and the death of a father. Children score 0 in years that fathers are alive and a 1 if fathers have passed away. In chapter 5 we explicitly focus on the parental divorce. Children score 0 in years that parents are married and 1 in the years after a parental divorce. Some of the life course information is measured by population registration data of the children. Age is measured in years and male children score 0, while female children score a 1.

2.5 Strengths and Limitations

The Criminal Career and Life course Study is unique and very well suited to investigate the intergenerational transmission of crime. The design of the study is prospective and longitudinal, focusing on the entire criminal careers of both fathers and children. With the use of the CCLS we are able to study the criminal acts of a very large number of parents and children in great detail. As the exact timing of each criminal act is registered, the entire criminal life courses of both parents as well as children can be constructed. This allows for a unique longitudinal focus.

Of course, the Criminal Career and Life course Study also faces some limitations. Most limitations are due to our use of administrative data. The first set of limitations has to do with the representativeness of the sample. The CCLS only provides administrative data and thus contains solely information about those individuals that were arrested and convicted of a crime. This results in a select group of criminals. A second limitation concerning the representativeness is due to the construction of the CCLS. All criminal fathers in this thesis are convicted for a criminal act in 1977. As a result of that, the group

of criminal fathers is by no means representative for the present population of criminals. In 1977, the composition of the Dutch population of criminals was different from the composition in 2010. Especially the number of ethnic minorities in the sample (which was relatively low in 1977) is very small compared to the number of ethnic minorities in the present population of criminals.

A second set of limitations has to do with the measurements used in this thesis. The most important limitation concerns the measurement of criminal behavior. Only those criminal acts which are noticed by the police and for which a conviction followed in a courtroom are included in this study. This of course, leads to an underestimation of the total number of criminal acts. Another limitation is that criminal behavior of children is only assessed after the age of 12. Some children will commit criminal acts before the age of 12, but cannot be convicted for these crimes. As a consequence, these criminal acts do not appear in our data. A third limitation concerning the measurements in this study is that we will not have measurements for control variables. We will thus not be able to control for socio-economic status, parenting strategies, neighborhood characteristics.

Despite these limitations, we presume that these data are the best data presently available to answer our research questions. The alternative for the use of official, administrative data would be the use of self-report data. It would be unfeasible to collect a comparable dataset using self-report data. Memory-problems and problems concerning social desirability as well as non-response problems would make such a design impossible. Also, the use of official data allows for the study of serious delinquent acts, which is usually not the case in self-report research. In chapter 8, we will shed some more light on the pros and cons of the Criminal Career and Life Course Study.

2.6 Analytic Strategy

Nested data structure

The data we use in this thesis have a nested structure. The total sample consists of 7,987 children nested within 3,500 fathers. This is slightly more than 2 children per father. These children share the same home, neighborhood and family environment. Of course, they also share the same father who will display the same criminal behavior. In Table 2.4, the nested structure of the data becomes clearer. In this Table, the total number of criminal acts committed by the children belonging to the same father is shown. A large part of the convictions are committed by siblings raised within the same families. The bottom two rows of Table 2.4 show that a very small percentage of the families, is responsible for more than 40 % of all delinquent acts committed by the 7,987 children in our dataset. Table 2.4 thus shows a strong clustering of criminal activity among siblings.

Table 2.4: Convictions of children within fathers

Fathers	# children	Mean number of convictions	# convictions	% of total # of convictions
2,195	4,190	0	0	0
419	1,278	<1	605	4.7
341	864	1-2	1,072	8.4
293	755	2-4	2,048	16.0
125	309	4-6	1,443	11.3
111	311	6-10	2,318	18.1
53	142	10-15	1,696	13.2
53	138	> 15	3,628	28.3
3,590	7,987		12,810	100

The nested structure of our data is not only characterized by children within fathers, but also by person-years within children. In this thesis, we focus on the development of criminal life courses. In order to investigate developments we have designed person-period-files. In these person-period-files, each record represents a year of a live of an individual. The datasets we will analyze contain a record for every child for every year after the age of 12 up until the age of 40. Not all the children have reached the age of 40 in 2005. As some children are only 15 in 2005 while others are already 40, for some children there are only a few lines in the person-period file, while for others there are lines for every year from their 12th until their 40th birthday. When a child died in a specific year, no records for subsequent years are included. For every year we recorded whether a child was convicted of one or more crimes.

Methods

In order to control for the nested structure of the data, we will apply multilevel models for nested or repeated data (Bryk & Raudenbusch, 1992). Multilevel models have become widely used in the analysis of criminal careers (Horney, et al., 2005; Blokland, 2005; Laub & Sampson, 2003). These models are especially suited for our analyses, because the interdependence of the observations within individuals and within families is adjusted by taking into account the correlation of the error components at the different levels. We estimate the development of criminal behavior over time on three levels[2]: a year-level (level 1), an individual level (level 2) and a family-level (level 3).

The central outcome variable in this thesis will be the development of individual criminal careers. In several chapters, we will thus investigate the development of the criminal careers of children. These children are nested within fathers. Information about persons is registered for every year. Some information is time-constant, that means that

[2] In some cases, the statistical software package we use does not allow for multilevel models with 3 levels, in those cases we only account for the clustering of years within persons (2 levels).

the information is identical in every year (e.g. the sex of the individual, the number of children within a family). Other information is time-varying, this information can change over time. The most important time-varying variable is the dependent variable: For each year within each individual is registered whether or not he was convicted of a crime. Other time-varying variables are whether or not a father committed a crime in a certain year and whether or not parents were divorced in a certain year. As the ages of the children greatly differ (some children have already reached the age of 40, while other are only 15 years old), the number of observations (years) also differs between individuals. Therefore, multilevel models are the most appropriate application. These models will evaluate the odds of committing a criminal acts in a given year where children are observed annually from ages 12 onwards (level 1), with clustering at the child level (level 2) and the family level (level 3).

Next to the use of multilevel models with random slopes, we will also use some other techniques to analyze the developments of criminal careers. For instance, in chapter 3, we will apply trajectory analysis in order to describe differences between criminal trajectories of fathers and criminal trajectories of children. In order to do so, we use Nagin and Land's (1993) semi parametric group based modeling approach (see also Nagin 1999, 2005) and estimate a zero-inflated Poisson form of a group-based trajectory model in which the natural logarithm of the number of convictions λ for persons j at age t, $\ln(\lambda_{jt})$, is specified to follow a cubic function of age (age, age^2 and age^3). This analysis results in the identification of a number of different groups of individuals who display similar behavioral trajectories. Conceptually, this approach identifies groups of individuals who display similar behavioral trajectories (Nagin 2005). This analytic strategy is an advancement over traditional analyses in that rather than examining average trajectories, group based trajectory analysis allows for a within group examination of life course offending trajectories – increasing our ability to differentiate a life-course-persistent pathway.

In chapter 5, we will apply fixed effect panel models in order to estimate an effect of parental divorce on the criminal careers of children. The most rigorous way to do so is through the use of a fixed-effects model. Fixed effect panel models adjust for so-called "unobserved heterogeneity" by restricting attention to within-individual change. The model is prominently suitable to test causal relations. By using fixed effect panel models we thus take advantage of the strengths of the CCLS data (i.e., the unique longitudinal data on time-varying variables) and compensate as much as possible for the weaknesses (i.e., the lack of relevant time-stable confounding variables).

Chapter 3

The relationships between conviction trajectories of fathers and their sons and daughters

An earlier version of this chapter was published as: Van de Rakt, M., Nieuwbeerta P., & Graaf, de., ND. (2008) Like father, like son? The relationship between conviction trajectories of fathers and their sons and daughters. *British journal of criminology, 48* (2), 538-556.

3.1 Introduction

Previous studies already established an association between criminal convictions of fathers and the convictions of children. Although these studies – the Cambridge Study in Delinquent Development in particular- have made headway in understanding to what extent criminal behavior is transmitted from one generation to the next, only a limited number of studies have a sufficient amount of statistical power to allow examination of the relationship between offending behavior of parents and their children (e.g. Farrington, et al., 1996; Thornberry, et al., 2003). It therefore remains important to establish the influence of criminal convictions of fathers on the criminal convictions of their offspring once again, while using the large-scale data of the CCLS. Establishing the extent of the association between criminal convictions of fathers and children will therefore be the principal aim of this chapter.

In this chapter, we will also begin with a theoretical and methodological connection of the research tradition of the developmental and life course criminology to the tradition of the intergenerational transmission of convictions. Within the tradition of the developmental and life course criminology crime is viewed as one of many developmental trajectories one commences during the course of one's life. Important transitions in the life cycle like getting married or entering the labor market influence development in other domains like crime (e.g. Bushway, Brame & Paternoster, 2003; Laub & Sampson, 2003; Blokland & Nieuwbeerta, 2006). In this chapter, we will introduce theories and apply methods from the tradition of the developmental and life course criminology for the investigation of the intergenerational transmission. This will allow for insights into the extent to which paternal criminal convictions influence the development of the entire criminal careers of their children. The results of this chapter will give first insights into the intergenerational transmission of paternal convictions over the entire life span.

In order to examine the intergenerational transmission of convictions correctly, we will make use of state-of-the-art research methods. In this chapter, we will first examine whether criminal careers can be prospectively differentiated by the criminal history of the father. Subsequently, we will use group based trajectory analysis and retrospectively identify distinct developmental criminal trajectories of the children. This allows us to test whether the criminal trajectories of the children resemble those of the fathers. This is of relevance, since when analyzing the criminal behavior prospectively also within the groups most at risk (those with a father who frequently commits criminal acts) we always examine the average criminal career. Examining the intergenerational transmission of criminal behavior both prospectively and retrospectively will give the most complete analysis possible. In this chapter, the following research questions will be

addressed: *To what extent does intergenerational transmission of convictions exist?* And: *To what extent do criminal careers of children differ between those with non-criminal fathers and those with fathers belonging to a group of persistent recidivists?*

3.2 Previous research

Although previous empirical research on intergenerational transmission of convictions is still rather limited in scope, several studies did examine similarities in criminal behavior between parents and their children. Unfortunately, many of these studies have disadvantages. First, most studies use small samples and retrospective designs. Second, none of the studies (except the CSDD – see below) analyses the influences of parental criminal behavior on the behavior of their children after the period of adolescence. Third, most studies concentrate on sons and neglect the influences of parental convictions on their daughters. Fourth, most studies lack a comparable control group. Finally, almost all earlier studies are descriptive in nature, developmental and criminological theories are hardly tested.

Despite these limitations, some studies did reveal important insights in the association between parental criminality and offspring criminality (see also Table 1.1 in chapter 1). In the Chicago Youth Development Study, Gorman-Smith et al. (1998) found that persistent delinquents are more likely to originate from families with deviant conducts. In the Pittsburgh Youth Study Farrington et. al. (2001) noted a similar pattern. These results show that the father is the most important relative in predicting the criminal behavior of an individual. Sampson and Laub (1993) also reveal a substantial association between the criminal behavior of fathers and their offspring in their analyses of the Glueck-data. This association is mediated via upbringing and supervision. A study by Thornberry (2005) investigates the influence of antisocial behavior of parents on the aggressive behavior of their young children. For fathers a direct effect of delinquency on the behavior of their young children exists. Also, a direct effect of parents' delinquency on the behavior of their children is revealed; for mothers this relation is mediated through parenting-strategy she uses (Thornberry, et al., 2003).

A landmark study in the tradition of the intergenerational transmission of crime is of course the Cambridge Study in Delinquent Development (CSDD). This study, which is executed by Farrington (originally by West), includes data of a population of 411 London boys (born in 1958) and their families. On basis of interviews the boys were tracked from the age of 8 until 40 and official data were collected as well. Most of these 411 boys have children of their own nowadays. These children – now between 18 and 35 years old - are also interviewed (Smith & Farrington, 2004). In numerous articles the relations between

offending of father, brothers, sisters and individuals have been investigated. Findings of the CSDD are impressive. The CSDD identifies the relation between criminal behavior of the parents of the research subjects (G1) and the criminal behavior of research subjects themselves (G2), as well as between criminal behavior of the research subjects (G2) and that of their children (G3). Rowe and Farrington (1997) reveal a correlation of .43 between the criminal convictions of the research subjects and those of their fathers. Furthermore, children of delinquent research subjects had behavioral problems in 39 % of the cases. Children of non-delinquent research subjects had behavioral problems in only 20 % of the cases (Smith and Farrington, 2004). In sum, the results of the available empirical studies on the intergenerational transmission of convictions indicate a moderately strong association between the criminal behavior of parents and that of their children.

3.3. Theories

The tradition of the developmental and life course criminology focuses on the development of criminal behavior over individual life courses. Developmental and life course theories of crime are used to explain these individual life courses. We argue that we can apply these theories to the research on intergenerational transmission of criminal convictions as well. We distinguish two ways of intergenerational criminal development in which one will easily recognize developmental and life course theories (e.g. Blokland, 2005).

First, we distinguish a group of theories proposing a static transmission. Static theories of crime focus on a static, unchangeable transmission of all kinds of conduct problems. Second, we distinguish a dynamic transmission. Dynamic theories of crime assume that all kinds of problems are transmitted, but numerous factors can interact with and change this transmission.

Theories proposing a static view state that the transmission of criminal behavior will take place very early in life and the tendency to commit crime will remain stable ever after. Biological theories, for example would predicted a general static transmission of criminal behavior. According to biological theories, the causes for displaying criminal behavior are saved in a specific combination of DNA. Research on twins shows that there exists more resemblance in criminal behavior between monozygotic twins than between dizygotic twins (e.g. Kaufman & Zigler, 1993). As genotypes are transmitted from one generation to another, tendencies to display anti-social (as well as socially desirable) behavior are transmitted as well. Several psychological theories assume that not (only) genetic factors but personality is responsible for the general static transmission from

father to their offspring. These personalities are formed in the childhood years and remain stable ever after. Some have a life-long stronger tendency to commit crime than others. An important example of such a psychological theory is the self control theory (Gottfredson & Hirschi, 1990). According to Gotffredson and Hirschi, insufficient self control is caused by an unfortunate upbringing. Parents who do not consequently control, recognize and punish deviant behavior of their young children, cause a low level of self control of their children. After childhood, this level of self control and its expressions through delinquent and antisocial behavior remain stable.

Theories proposing a dynamic view assume that changes in life circumstances can have large impacts on the transmission of criminal behavior from one generation to the other. Divorce of the parents for example could moderate the transmission of criminal behavior from fathers to their offspring (Juby & Farrington, 2001). An important example of a dynamic theory is the age graded theory of informal social control (Sampson & Laub, 1990). According to this theory, changes in bonds with education, family and work can either enhance of diminish the chance of committing crime (Laub, Nagin & Sampson, 1998). Another theory predicting a dynamic transmission is for example the differential association theory (Sutherland et al., 1992). A father who commits delinquent acts teaches the skills, norms and values needed to display such antisocial behavior. The more time a child spends with a criminal father, the larger the probability the child will commit delinquent acts as well.

Testing the causal structures behind the resemblance in criminal behavior of fathers and their children will remain outside the scope of the analyses in this chapter. The two distinct theoretical concepts will however provide an excellent starting point for interpreting our findings and for the deduction of hypotheses in the following chapters of this thesis.

3.4 Methodology

Father's conviction trajectories

Before we examine intergenerational transmission, we will first describe the measurements we will use in this chapter. We will first focus on the characteristics of the fathers' criminal careers. Then we will describe the characteristics of the children's criminal careers and finally we will present some descriptive statistics of both fathers as well as their children.

There are substantial differences across fathers. The fathers in the control group have –by definition- no convictions. Of the convicted fathers 20.6 percent has 1

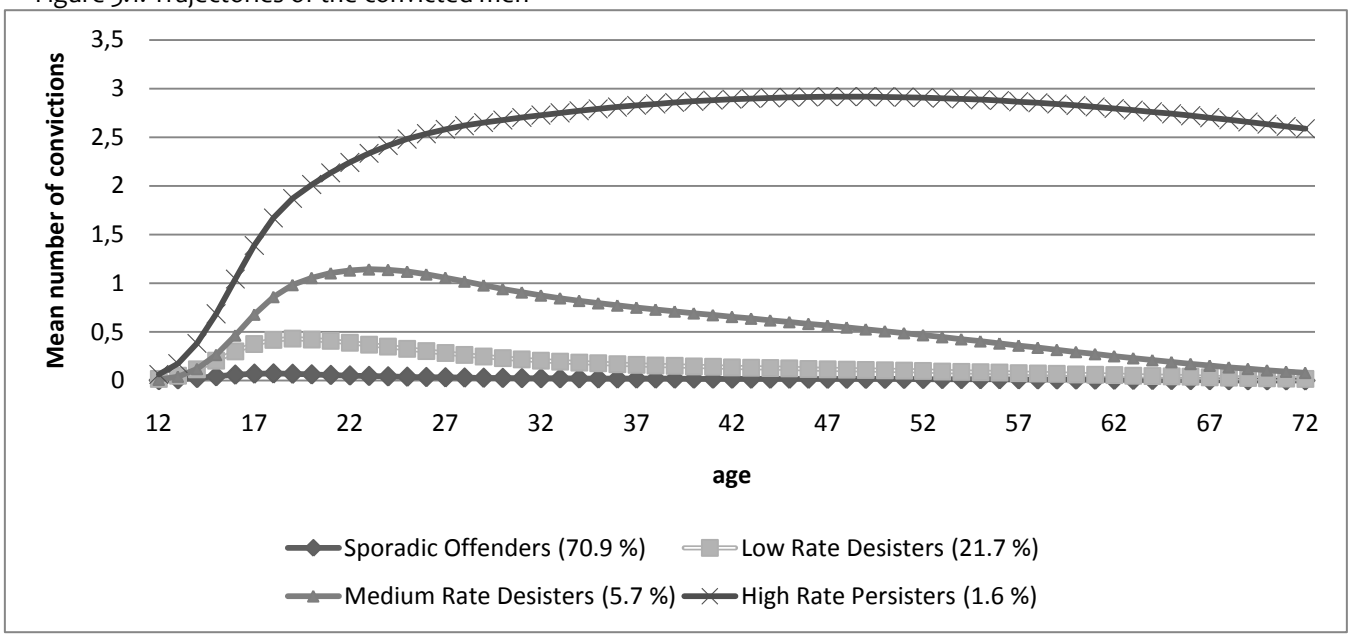
conviction, 31.3 percent 2-5 convictions, 26.2 percent between 6 and 15 convictions and 21.9 percent over 15. The fathers can be differentiated based on the number of convictions, but also based on the shapes of their longitudinal conviction trajectories. In order to do so, we use Nagin and Land's (1993) semi parametric group based modeling approach (see also Nagin 1999, 2005) and estimate a zero-inflated Poisson form of a group-based trajectory model in which the natural logarithm of the number of convictions λ for persons j at age t, $\ln(\lambda_{jt})$, is specified to follow a cubic function of age (age, age^2 and age^3). This analysis results in the identification of a number of different groups of individuals who display similar behavioral trajectories. Conceptually, this approach identifies groups of individuals who display similar behavioral trajectories (Nagin 2005). This analytic strategy is an advancement over previous analyses in that rather than examining average trajectories, group based trajectory analysis allows for a within group examination of life course offending trajectories – increasing our ability to isolate a life-course-persistent pathway.

Analyses of the CCLS-data employing these semi parametric group based models show that four groups can be distinguished. We added a fifth group consisting of control-fathers. We will not discuss the model and the resulting groups in detail, because these have been discussed in depth in an article by Blokland, Nagin and Nieuwbeerta (2005).[3] Note that these analyses are done with all the convicted men in the CCLS group. Among them are many who did not have children (see Table 3.2 as well).

We suffice by giving a brief description of the characteristics of the five trajectory groups. The first group consists of the Control-Fathers (CF), these fathers did not commit offences. The second group (71%) is called the Sporadic Offenders (SO). These men have committed one or only very few delinquent acts. A third group of men (22%) consists of individuals who commit relatively few delinquent acts and who are especially active in adolescence. This group is called the Low-rate Desisters (LR-D). The fourth group of men (6%) we distinguish is called the Moderate-rate Desisters (MR-D). These persons commit relatively many delinquent acts, but tend to stop when they reach adulthood. The curves of the LR-D and the MR-D thus show a rise and decline in the number of convictions, resembling the familiar aggregated age-crime curve. Finally, we distinguish a fifth and last group of men (2% of the sample). These men have very many convictions and keep on committing offences long after they have reached adulthood. We call them the High-Rate Persisters (HR-P). In figure 3.1 we show the results of the group based trajectory analysis, the criminal careers of the four trajectory-groups are shown (CF are not shown).

[3] Note that these analyses included also 344 women, so the total N. of cases was 4615 persons

Figure 3.1: Trajectories of the convicted men



Children's conviction trajectories

We will now focus on the characteristics of the criminal careers of the children. To analyze the convictions over the life course of the children, we created a person-period file. In this file, every line represents one year of each child from their 12th birthday until their 40th. The person period file for the entire sample consists of 140,114 years, of 7,987 children within 3500 fathers (3,015 fathers in the CCLS group and 485 Control Fathers). Not all the children have reached the age of 40 in 2005. As some children are only 15 in 2005 while others are already 40, for some children there are only a few lines in the person-period file, while for others there are lines for every year from their 12th until their 40th birthday (see Table 3.1).

Table 3.1: Number of observed children on different ages

Age	All children	Sons	Daughters
12	7987	4042	3945
20	6242	3151	3091
25	4951	2493	2458
30	3932	1989	1943
35	2912	1486	1426
40	2034	1052	982

Table 3.1 displays the children by age crime counts from ages 12 (the youngest age at which persons in the Netherlands get convictions under Penal Law) to 40 (the end of our observation period).

Figure 3.2 shows the actual mean probability of having a conviction for all crimes for boys and girls. There is a peaking in adolescence followed by a decline through middle adulthood, with eventually disappearance in the fifties. For the sons and daughters the shape of the mean trajectories is similar, with a peak in late adolescence and early adulthood. The number of convictions for sons is substantially higher than for daughters. Also, the trajectory of daughters seems to be a bit flatter than the trajectory for sons has a much sharper peak. It is to be noted that the graphs represent average children. There is substantial variation between children in age crime trajectories.

Figure 3.2: Mean number of convictions children (sons and daughters) over their life course (N=7,987)

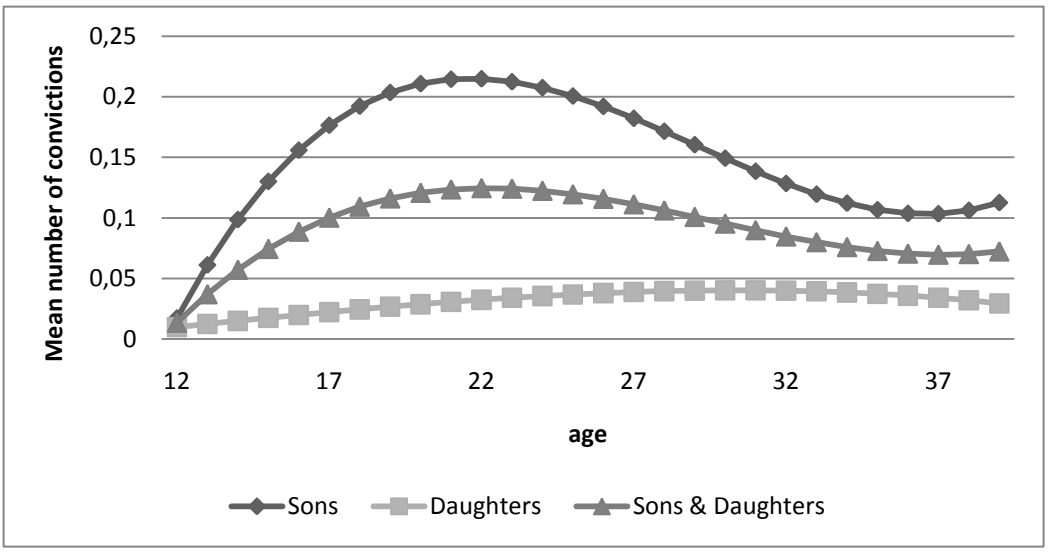


Table 3.2: Characteristics of CCLS men, control persons and their children[a]

	Control fathers	Sporadic Offenders	Low Rate-Desisters	Medium Rate-Desisters	High Rate-Persisters	Total
Fathers						
Number of men	690	2235	1324	521	191	4271
Mean # of convictions	0.0	1.4	9.7	32.9	127.6	11.4
Mean age in 2003	53.6	55.7	53.3	53.1	50.7	53.9
% Ever married up to 50	84.3	81.9	81.4	71.5	62.6	73.6
Mean # of partners[b]	1.13	1.17	1.24	1.35	1.39	1.29
Number of men with children[c]	485	1738	914	279	84	3500
% of fathers with children	78.0	75.4	70.5	69.3	59.1	67.9
Mean age when 1[e] child	30.2	28.2	28.1	27.6	25.4	27.4
Mean # of Children per father	2.37	2.33	2.50	2.23	2.40	2.37
% children out of wedlock	6.9	10.9	12.0	29.1	35.8	22.4
Children						
Number of children	1066	4058	2089	629	145	7987
Number of sons	562	2074	1012	323	71	4088
Number of daughters	504	1984	1077	306	74	3997
Mean age of the children in 2005	28.6	32.3	29.2	29.4	27.8	29.0

[a]Via F-tests (with means) and Chi2-tests (with percentages and counts)is tested whether differences were significant.
[b] the number of partners is calculated over the control and convicted persons that married at least once (N = 3126).
[c] i.e. children older than 12 in 2003.

Description fathers and children

Table 3.2 presents descriptive statistics of the fathers and their children. Fathers are on average 54 years old in 2003 and had 11,4 convictions over their life course. As a father commits more criminal acts chances are higher he has never been married and never has had any children. But, as persistent delinquents get married, they get married more often (1.39 partners in the HR-P-group and 1.13 in the Control-group). Fathers with a more extensive criminal career (MR-D and HR-P) who do have children, have them at a younger age than fathers who obey the law and also more often have children born out of wedlock.

The children of the CCLS fathers and the control fathers have a mean age of 29 years old in 2005, with quite some variation. The youngest children are (through selection) 12, while the oldest are 67 years old (note that we follow people up until their 40th birthday).

3.5 Results

The analyses of this chapter are aimed to determine the degree of intergenerational transmission of convictions. We will first examine whether criminal careers of children are prospectively related to the conviction trajectory group of their fathers. We differentiate between the five distinct trajectories of the fathers and analyze the criminal life course patterns of the children. Subsequently, we will use group based trajectory analysis in order to retrospectively identify distinct developmental offending trajectories of the children. This will allow us to examine whether the offending trajectories of the children resemble those of the fathers. In this way we will be able to examine whether the most persistent criminal children have the most persistent criminal fathers (or not). So, by examining the intergenerational transmission of convictions both prospectively and retrospectively we aim to give the most complete description of the intergenerational transmission of convictions as possible.

Prospectively defined groups

We start our prospective analysis with conducting an analysis in which the number of convictions of the child is related to the trajectory group membership of the father (table 3.3).

Table 3.3: Relation between trajectory group of the fathers and the numbers of convictions of children

	Control fathers	Sporadic Offenders	Low Rate-Desisters	Medium Rate-Desisters	High Rate-Persisters
Children					
0 convictions	88.8	76.0	67.4	59.1	61.4
1 convictions	6.5	8.7	10.3	8.9	11.7
2-5 convictions	3.8	9.7	11.8	15.7	13.1
More than 5	0.8	5.5	10.5	16.2	13.8
N of children	1066	4058	2089	629	145
Sons					
0 convictions	82.7	64.2	52.1	47.4	47.9
1 convictions	9.6	10.9	12.3	6.8	8.5
2-5 convictions	6.2	15.1	17.3	18.6	18.3
More than 5	1.4	9.8	18.4	27.2	25.4
N of sons	562	2074	1012	323	71
Daughters					
0 convictions	95.6	88.5	81.8	71.6	74.3
1 convictions	3.0	6.4	8.5	11.1	14.9
2-5 convictions	1.2	4.1	6.6	12.7	8.1
More than 5	0.2	1.1	3.1	4.6	2.7
N of daughters	504	1984	1077	306	74

Children of non-convicted fathers (Control Fathers) appear to have the least convictions (only in about 10 % of the cases). Children of fathers belonging to the Sporadic Offenders (SO) however appear to have convictions more often (ranging from 14 % to 30%). Especially children from fathers with persistent conviction trajectory (HR-P) have a very high chance to commit a have many convictions themselves.[4] Daughters have fewer convictions than sons, but the results of Table 3.3 indicate that the influence of their fathers' criminal behavior on the number of convictions seems to be alike for daughters and sons.

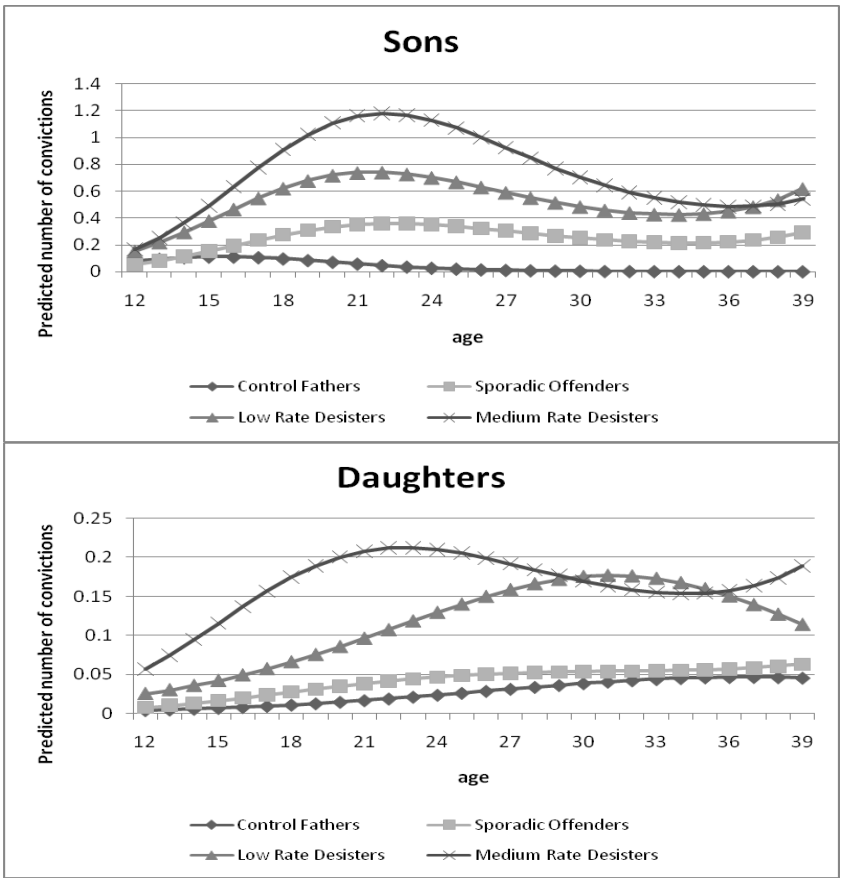
Our study continues by further analyzing the predictability of long term patterns of convictions of children over the life course. Specifically, we examine whether trajectories of convictions of children can be prospectively differentiated by trajectories of their fathers. This allows us to investigate the second research question of this chapter in which we study to what extent the criminal careers of children differ between those with non-criminal fathers and those with fathers belonging to a group of persistent recidivists.

To examine whether children's trajectories of offending can be differentiated by fathers' conviction patterns we ran a series of predicted probabilities. We estimated multilevel Poisson regression models with three age terms (age, age-squared, and age-cubic) and present the findings for total number of criminal convictions at each age from 12 to the age 40. The results of the multilevel models are presented in figure 3.3. The predicted probabilities for total criminal convictions of the children (sons and daughters) by the trajectory groups of their fathers are shown.

As the number of children from the HR-P-fathers is very small (see Table 3.4) and gets even smaller as children get older, we decided not to plot these patterns. The trajectories of the children of the four remaining groups are all shaped as typical age-crime curves. There do, however, exist differences in the heights of the curves and more subtle differences in the shapes of the trajectories. Also, there exist numerous differences between the trajectories of sons and daughters. Note that chances for daughters to have convictions are much smaller than chances for sons. Children (both sons and daughters) of Control Fathers have the lowest likelihood of convictions in every phase of their lives. Sons of Control Fathers seem to have their sporadic convictions early in life, while daughters of control-fathers tend to have more convictions later in the life courses. Children of Sporadic Offenders (SO) have more convictions than children of Control Fathers, but their chances are still relatively low compared to the children from LR-D and MR-D fathers.

[4] These conclusions are confirmed by the results of a Poisson regression analysis in which we control for (among others) the effects of the sex and the age of the children as well as the clustering of children within fathers (see appendix 1; Table 3.3b).

Figure 3.3: Predicted number of convictions of children (sons and daughters) by fathers' trajectory



Especially for daughters, curves of children of SO resemble those of children of Control Fathers. Children from fathers belonging to the LR-D and MR-D groups, have more convictions in every phase of their lives. For sons, the peak in the criminal careers from children of LR-D and MR-D is much earlier than the peak of the children of Control Fathers and Sporadic Offenders. These sons thus not only have more convictions, but on average start at a relatively young age. Daughters from LR-D seem to peak late in life, while daughters from MR-D are more likely to peak early in life and remain relatively stable in their convictions at a moderately high level after the age of 30.

Retrospectively defined groups

Having determined the level of intergenerational transmission of criminal convictions prospectively, we will also determine this retrospectively. To do so, we will employ a group based trajectory analysis in order to define children's offending trajectories. The procedure is similar to the one used earlier analyzing fathers' criminal trajectories. We decide to conduct a retrospective analysis in order to shed more light on those children who are very persistent in their criminal behavior. Group based trajectory analysis allows for a within group examination of life course convictions trajectories – increasing our ability to isolate a life-course-persistent pathway.

So, again we use Nagin and Land's (1993) semi parametric group based modeling approach and estimate a zero-inflated Poisson form of a group-based trajectory model in which the natural logarithm of the number of convictions λ for children j at age t, $\ln(\lambda_{jt})$, is specified to follow a cubic function of age (age, age^2 and age^3). This analysis results in the identification of a number of different groups of children who display similar behavioral trajectories from 12 to 40 years of age. Our model selection analysis indicated that – similar to analyses of the fathers - a four group model provided a good representation of the conviction histories when considering parsimony and comprehensibility.

The mean trajectories of the four groups of children are shown in Figure 3.4. Group membership is determined based on the posterior probabilities. The first trajectory group non-delinquents (ND) is made up of nearly 80 % the sample and evidences a zero conviction rate throughout adolescence and adulthood. A second trajectory group (14 % of the sample), labeled here moderate desisters (MD) follows a conviction rate trajectory that rises steadily through early adulthood and begins a declining pattern in the mid to late thirties. The third group early desisters (ED) follows the typical age-crime curve, with conviction rates peaking in early adulthood and declining steadily thereafter, comprises 5% of the sample. Finally, a group which we label chronics (CR) demonstrates a high rate of convictions throughout the twenties and thirties (1% of the sample). This group begins a declining pattern in the late thirties.

Figure 3.4: Estimated trajectories of number of convictions per year of the children over the life course for four groups (N=7,987)

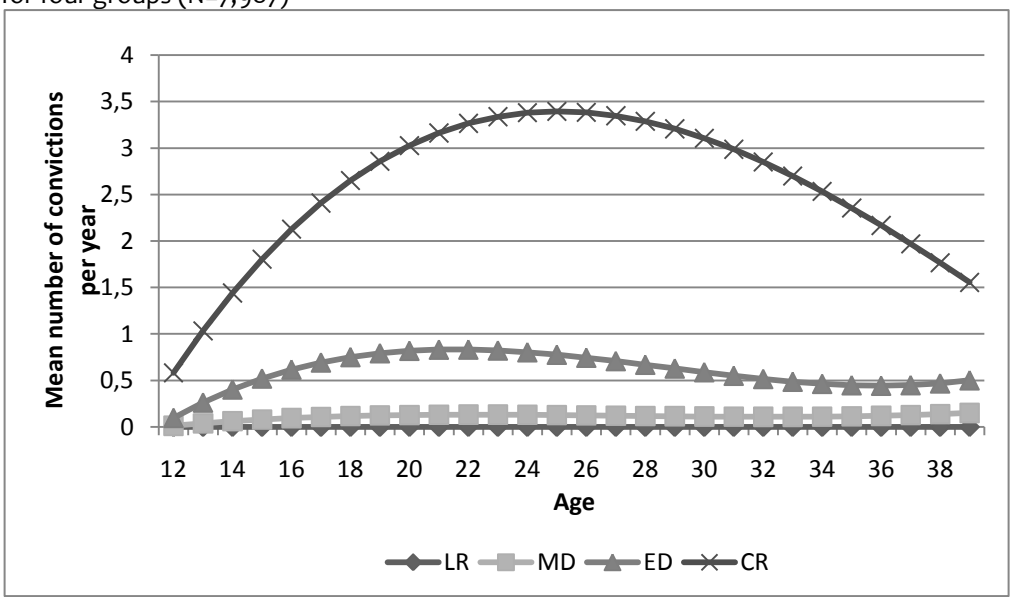


Table 3.4 displays the means for selected characteristics of criminal behavior of the children. The table also displays the means for other important personal characteristics of the children. The results illustrate significant differences in the means across the four groups of children. Among the chronics and early desisters are a lot of boys and children who are born out of wedlock. Both measures of conviction patterns – early onset and number of convictions – evidence great differences. Specifically, the early desisters and chronics are more often characterized by early onset and chronic offending.

Table 3.4: Characteristics of children by their trajectory group[a]

	Non Delinquents	Moderate Desisters	Early Desisters	Chronics	Total
N. of children	6389	1110	412	76	7987
% of total	80%	13.9%	5.2%	1.0%	100%
% sons	43.8%	73.1%	88.3%	89.5%	50.6%
% born out of wedlock	13.5%	20.4%	23.5%	26.3%	18.3%
Mean number of convictions	0,0	2.1	10.4	40.3	1.6
Mean age of first conviction (for those convicted)	-	20.5	16.4	15.1	20.5

[a]Via F-tests (with means) and Chi2-tests (with percentages and counts)we established that differences were significant.

The final step in our analysis is a comparison between the trajectory group memberships of the children with that of their fathers. This will complete the answer to our second research question. The results are presented in Table 3.5.

There is a clear relationship between the conviction patters of the fathers and their children. Children of fathers in the control group predominantly belong to non delinquent trajectory group (93.1 %), whereas children of fathers in the High-rate Persistent (HR-P) only in 69.0 % belong to this non-criminal group. These children have a relatively high chance of being classified into the Chronic offenders (4.1 %). Girls much more often belong to the non delinquent trajectory group, but as a father belongs to a more persistent trajectory group, girls have –as have boys- a much higher chance to belong to one of the other trajectory groups.

Table 3.5: Relation trajectory group membership of fathers and that of their children

	Control Fathers	Sporadic Offenders	Low Rate-Desisters	Medium Rate-Desisters	High Rate-Persisters	Total
Children						
Non Delinquents	93.1	82.8	73.4	64.4	69.0	6389
Moderate Desisters	5.6	13.2	17.6	19.1	18.6	1110
Early Desisters	1.2	3.6	7.5	13.4	8.3	412
Chronics	.1	.4	1.5	3.4	4.1	76
N of children	1066	4058	2098	629	145	7987
Sons						
Non Delinquents	89.3	72.1	59.2	51.1	52.1	2799
Moderate Desisters	8.7	20.7	24.3	21.4	23.9	811
Early Desisters	2.0	6.3	13.7	22.0	16.9	364
Chronics	.0	.8	2.8	5.6	7.0	68
N of sons	562	2074	1012	323	71	4042
Daughters						
Non Delinquents	97.2	93.4	86.7	78.4	85.1	3590
Moderate Desisters	2.2	5.3	11.3	16.7	13.5	299
Early Desisters	.4	.8	1.7	4.2	0	48
Chronics	.2	.1	.3	.7	1.4	8
N of daughters	504	1984	1077	306	74	3945

3.6 Conclusions

In this chapter we made a first step to investigate the extent of the intergenerational transmission of convictions. We analyzed the relationship between the convictions of fathers and the development of convictions of their offspring over the entire life span. In order to place this research in a theoretical context and to understand the mechanisms

behind the intergenerational transmission of crime – although without claiming conclusive tests - we proposed a theoretical framework with two distinct patterns of intergenerational transmission of offending. First, we distinguished a static perspective. According to this view, criminal behavior is transmitted from parents on their children very early in life and is stable ever after. Second, we described a dynamic view, in which life course changes and circumstances are of vital importance to the transmission of criminal behavior. In this chapter, we could not yet provide a conclusive test for the theories presented. In the following chapters of this thesis, static and dynamic theories will be tested against each other.

We performed trajectory modeling and multilevel models to establish differences between the criminal careers of children from different group of fathers. Also we investigated on differences within the groups of children in the development of their individual criminal careers. Our results show that the number of convictions of fathers relates substantially to the number of convictions of their children, as was already revealed by Farrington and others in the CSDD. The relation remains substantial, even after controlling for age and sex. The chance of a conviction is especially high among the children of fathers belonging to the Moderate-rate Desisters and the High Rate Persisters. Trajectories of children from Control Fathers and Sporadic Offenders are characterized by low offending chances throughout their life courses. Children from persistent criminals however, tend to commit more criminal acts in every phase of their life and start their criminal career in a much earlier stage in their lives. Our results further show that within our group of 7,987 children, four groups of children can be distinguished each with specific conviction trajectories. The first group consists of the fast majority of children (about 80 %) who do not have any convictions. The other groups are called moderate desisters, early desisters and chronic offenders and contain respectively, 14, 5 and 1 % of the children. These groups do commit criminal acts, ranging from 1 or 2 convictions among the moderate desisters and a high number of convictions (> 15) among the chronic offenders. A final analysis combined the trajectory analyses of fathers and children and shows that having a father belonging to a more persistent trajectory group results in a higher chance of belonging to such a trajectory group as well.

Although the results of this chapter could not provide a conclusive test for the predictions of the static and the dynamic theories, the results of the trajectory analyses do however largely agree with the notions of the static theories. The results of the analyses clearly show that although the heights of the trajectories differ, the shapes of the trajectories appear rather similar. Also according to static theories, everybody follows the exact same age-crime curve, while the heights of the curves differ according

to criminal propensity. The analyses in our following chapters will provide for more conclusive tests of the static versus the dynamic theories.

Comparing our results with results from the previous studies in general and studies from the CSDD in particular leads to much similarity. In line with the results of previous studies, we also find large correlations between the criminal acts of fathers and those of their children. Our relation is somewhat weaker then correlations reported by for instance Rowe and Farrington (1997). This could be explained by the differences in research design. We focus on fathers and their children (prospectively), while Rowe and Farrington report about criminal children and their fathers (retrospectively). As our research design is prospective and does not select upon the dependent variable (criminal behavior of children) we believe our results to be more accurate. The results of this chapter already greatly improve previous research, giving insights in the development of criminal careers of children from fathers with different criminal life courses. In the following chapters of this thesis, we will improve upon the previous research even more. We will focus on more aspects of the intergenerational transmission of convictions. This will allow for the testing of criminological theories and for investigating of new research topics.

Chapter 4

The timing of paternal criminal convictions: testing static and dynamic theories of crime

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4.1 Introduction

Numerous studies show a substantial influence of parents' criminal behavior on the criminal behavior of their children (e.g., Rowe and Farrington, 1997; Thornberry, et al., 2003). Most of these studies are limited in the sense that they only focus on correlations between numbers of convictions of fathers and children, and as such, they do not deal with the way parental influence develops over the course of children's lives.

In the previous chapter of this thesis, we already showed the influence of paternal criminal convictions on the development of criminal careers of children. Results of chapter 3 show that children whose fathers had an extensive criminal record had different criminal life courses from children with noncriminal fathers. Nevertheless, both groups of children show the typical age-crime curve. That is, they have a relatively low number of convictions in childhood, a rapid rise during adolescence, a peak in the mid-twenties and finally a slow decline thereafter. The differences between the groups of children are thus foremost differences in the height of the age-crime curves and not so much in the shapes of these curves.

In the current chapter, we will take the investigation of the intergenerational transmission of convictions a step further. We do so by posing the following research question: *To what extent is the intergenerational transmission of convictions dependent upon the timing of criminal acts of fathers?* By 'timing of criminal acts', we refer to the age of children when their father committed criminal acts. This line of inquiry enables us to answer questions like: 'Does a child only have a greater chance of a criminal conviction if the father commits a crime before the child was born or is this chance also increased if the father commits a crime when the child is an adolescent or even an adult?'

In this chapter, we will also make a first start with the testing of developmental criminological theories. We will again differentiate between the two paradigms: the static theories and the dynamic theories (Nagin and Paternoster, 1991; 2000). The second research question of this chapter therefore reads: *To what extent do static and dynamic theories explain the intergenerational transmission of convictions?* We derive (partly) conflicting hypotheses from each paradigm about the influence of the timing of criminal convictions of fathers on the development of criminal convictions of their children. We will also be able to test the extent to which static and dynamic theories succeed in explaining the intergenerational transmission of convictions.

4.2 Previous research

Most previous studies investigating the intergenerational transmission of criminal behavior focus on correlations between numbers of convictions of fathers and sons (e.g.,

Kaplan and Tolle, 2006; Farrington, et al., 2001; Thornberry et al., 2003). Relatively little is known about the mechanisms that cause the intergenerational transmission (but see: Bijleveld and Farrington, 2009). Also, only few studies pay attention to the development of criminal careers and even fewer to the exact point in time when fathers were (still) criminally active.

Nevertheless, several panel studies did reveal important insights into the association between parental criminal behavior and that of their offspring. Results from the Chicago Youth Development Study (Gorman-Smith, Tolan, Loeber and Henry, 1998) show that persistent delinquents are more likely to originate from families that display deviant conduct. In the Pittsburgh Youth Study, Farrington et al. (2001) note a similar pattern. The Rochester Youth Development Study (RYDS) executed by Thornberry (2005) investigates the influence of antisocial behavior of parents on the aggressive behavior of their young children. For fathers a direct effect of delinquency on the behavior of their young children exists. Also, a direct effect of parents' delinquency on the behavior of their children is revealed; for mothers, however, this relation is mediated through the parenting strategy she uses (Thornberry et al., 2003). In a more recent study, Thornberry et al. (2009) again show that parental antisocial behavior is related to that of their children as long as the parents have frequent contact with their children.

One study is responsible for most of the findings on intergenerational transmission of criminal behavior: the Cambridge Study in Delinquent Development (CSDD). Results of the CSDD show that the timing of convictions of parents barely influences the intergenerational transmission of criminal behavior. Parents who committed their final criminal act before the birth of their children, had about the same influence on the chance of their children committing crime as parents with a conviction after the child's birth (Smith and Farrington, 2004; Farrington, Lambert and West, 1998).

Summarizing, the results of the panel studies on the intergenerational transmission of convictions indicate a moderately strong association between the criminal behavior of parents and the behavior of their children. However, the influence of the exact timing of criminal behavior of fathers on the development of criminal careers of children remains largely untested. Moreover, the designs of these earlier studies also show several limitations. First, these studies use relatively small datasets, which precludes the use of more advanced statistical testing. Second, most studies employ very limited follow-up periods and neglect analysis of the effects of parents' criminal behavior on the behavior of adult offspring. Finally and most importantly, previous research lacks the testing of the predictions of criminological theories. In this chapter, we will investigate the exact timing of the criminal behavior of fathers and improve upon all of these drawbacks.

4.3 Theories

This study on the effects of timing of parental criminal behavior tests explanations from two traditions within the life course and developmental criminology. Our first set of hypotheses about the influence of timing of the convictions of fathers is derived from static theories. Secondly, a set of parallel hypotheses about the influence of timing is then derived from dynamic theories. We stress that while we test the explicit hypotheses in this study, the underlying assumptions and mechanisms remain, due to data limitations, largely implicit.

Static theories

Strict versions of static theories assert that population heterogeneity is the only explanation for differences in people's likelihood of committing crime. These theories assume that this likelihood (or propensity) to commit crime is not causally influenced by the level of delinquency of the father. The empirical relationship between criminal behavior of fathers and children is regarded as spurious.

Several static theories exist. They have in common their stress of the impact of personal characteristics, but they differ in the type of characteristics that they focus on, e.g., biological or psychological factors. Wilson and Herrnstein (1985), for example, propose that criminal behavior is caused by biological personality traits and constitutional factors. They explicitly mention criminal behavior of parents as a risk factor for the development of crime-favorable personality traits and constitutions.[5] Another example of a static theory, and probably the most tested in criminology, is Gottfredson and Hirschi's (1990) self control theory, which holds that criminal behavior is entirely caused by a lack of self control. Their theory assumes that people who have little self control display more (often) risk-taking behavior, are short-sighted, and aim at immediate gratification.

Gottfredson and Hirschi's self control theory assumes that inadequate parenting in early childhood is deemed responsible for a lack of self control and consequently for all sorts of unadjusted behavior, including crime. Children whose parents do not consistently monitor, correct and punish their behavior are more likely to have low levels of self control. According to Gottfredson and Hirschi, no parents encourage their children to commit crimes, irrespective of their own criminal history. However, as criminal parents themselves have little self control, their own behavior will be oriented towards

[5] Population heterogeneity could also come about because of biological (genetic) factors. However, that does not necessarily mean that biological explanations are entirely static. The influence of a genetic predisposition could change over the life course.

immediate gain, and they are unlikely to pass on the skills of self-discipline and delayed gratification to their children. They will furthermore be less likely to recognize criminal behavior in their children and will correct and punish less consistently, resulting in children with little self control. Parents with little self control (and many convictions) thus will have children with little self control (and many convictions) due to their inadequate parenting. The window of development of self control is considered to be rather short. Gottfredson and Hirschi (1990; 109) state that 'the level of self control distinguishes offenders from non-offenders and the degree of its presence can be established before criminal acts have been committed'. An explicit age is not mentioned in their work, although preadolescence, in the early years of life and early adolescence are mentioned. In this thesis, we assume that the level of self control remains stable from the age of 12. [6]

Summarizing, from static theories it can be derived that as a father commits more delinquent acts, the chance rises that his children will commit more delinquent acts as well. According to Gottfredson and Hirschi, self control remains stable after childhood, and persons with little self control have a higher chance of committing crime under all conditions, in every phase of their lives. According to the view of Wilson and Herrnstein (1985) the personality traits inherited and formed early in life will be transmitted from (criminal) parents to their children. So, according to these static theories, there will be heterogeneity between persons, but there can be no changes within persons. This leads to the following hypothesis: H1: *As fathers commit more criminal acts over the course of their lives, their children will have a greater chance of committing crime, regardless the timing of father's crimes* (father's crime hypothesis).

Since the relationship between father's criminal career and that of their children is assumed to be spurious, static theories also assume that the point in time when a father commits his crimes in no way influences the chance his child also commits crime. The number of criminal acts a father commits is due entirely to his personal characteristics that are transmitted to his children and that will subsequently lead to higher number of offences of his children. Whether a father commits his crimes before his children were born or when they were committed during their adolescence or even when they reach adulthood, it should make no difference. This suggests the following hypothesis: H2: *The timing of father's crimes does not affect the way children's criminal careers develop* (static hypothesis).

[6] Nagin and Paternoster (2000) point to the fact that Gottfredson and Hirschi do not refute the possibility of socialization after early childhood altogether. They do however believe that self control is a time-stable trait and that the rate at which socialization takes place after early childhood will be about the same for everyone. Although we are aware of this controversy, we will assume self control to be a time-stable characteristic.

Dynamic (learning)-theories

In direct contrast to static theories, dynamic theories assume that individuals' propensity to commit crimes can change during the life course. In dynamic theories, state dependence is very important, although it is important to stress that this does not mean that there is no room for population heterogeneity. Above and beyond persistent individual differences, life events are assumed to have effects on people's lives. Previous research shows that both population heterogeneity and life changes are important (Nagin and Paternoster, 2000). In most studies, the possible 'positive' effects of bonds with parents, institutions and spouses are investigated (Piquero, Farrington and Blumstein, 2003). In this chapter, however, we will analyze whether 'negative' (criminal) behavior of fathers influences one's criminal career, even if fathers commit their crimes after early childhood. In this study we apply two dynamic theories: differential association theory (Sutherland, Cressey and Luckenbill, 1992) and the age-graded theory of informal social control (Sampson and Laub, 1990). Due to data limitations we will not be able to test the specific mechanisms of either theory. We present these mechanisms mainly for illustrative purposes; other mechanisms could well account for the same hypothesis. However, we will be able to test whether dynamic factors are able to explain the influence of paternal criminal behavior on the development of criminal careers of children.

Differential association theory assumes that criminal behavior is taught in the same manner as normal (accepted) behavior. Learning criminal behavior would for a large part take place in intimate personal groups, such as the family. Not only the techniques individuals must master to commit crime can be taught, but also motives, values and attitudes towards crime can be learned. Association with delinquents then leads to a higher chance of learning and committing crime (e.g., Sutherland et al., 1992; Akers and Jensen, 2003). Association with criminal parents, who are role models for their children, is especially influential in determining children's criminal behavior.

In this chapter we test whether the criminal acts of fathers could induce learning effects in their children. Although we are not able to test the learning process itself, we can derive predictions about the outcomes of possible learning mechanisms. We illustrate our outcome-hypotheses with examples of how learning or imitation could take place. Children, when confronted with the criminal behavior of their father (e.g., because they witness the actual behavior or the father tells them about it), could store this information in their memory. In this way children acquire the techniques, knowledge and values needed to commit crime. Moreover, these children might come to view criminal behavior as normal and even desirable. From this follows that children would have a greater chance of committing crime after their father has committed a criminal act. This

so-called 'learning effect' suggests the following hypothesis: H3: *After a father commits a delinquent act, his children will then have a greater chance of committing crime as well* (learning hypothesis).

If a father commits several subsequent crimes, the learning effect can of course occur repeatedly. With every additional crime, the children could again be confronted with criminal behavior. Subsequent confrontations like the first could be direct, for instance when the children are also present at the crime scene, or indirect, if their father tells them about his criminal acts. Again, we would like to emphasize that these learning-mechanisms remain speculative. Subsequent confrontations could remind the child of the previous delinquent acts. The (implicit) norms are reinforced. The knowledge and techniques learned from the previous delinquent acts are repeated. Also, father's deviant behavior could come to appear a bit more normal to the child. We expect that with every additional delinquent act of the father the learning effect increases. Sampson and Laub (1990) speak of 'cumulative disadvantages' in this context. Repeated exposure to deviant behavior could feed the child's idea that criminal behavior is normal. We refer to this effect as the 'cumulative learning effect' and formulate the following hypothesis: H4: *With every additional delinquent act of the father, his children will have an increasingly larger chance of committing delinquent acts thereafter* (cumulative learning hypothesis).

We assume that the learning effect diminishes over time, because when time passes without any new crimes committed by the father, the memory could become less vivid. Knowledge about how best to commit crime might fade. Norms and values accompanying a criminal lifestyle are no longer reinforced. Gradually, the child's chance of committing crime is expected to diminish. Insights from psychology and biology show that experiences from the past subside if they are no longer reinforced (Wixted and Ebbesen, 1991; Ebbinghaus, 1913). We explicitly test whether such diminishment occurs. A plausible mechanism for diminishment would be that the child's memory of father's criminal behavior becomes less and less vivid when time since father's last crime passes. As the period of time since father's last criminal act lengthens, the increased chance of the child committing a delinquent act (as predicted in H3) will gradually be reduced. We call this the 'decay effect' and associate it with the following hypothesis: H5: *The more time that passes after a father has committed a crime, the more the initially increased chance of a child committing a crime (as predicted by the learning effect) diminishes* (decay hypothesis).

Psychological learning theories (e.g., Wixted and Ebbesen, 1991) show that memory fades less rapidly after repeated confrontation. Forgetting a confrontation with father's criminal behavior then would take more time if a father commits more criminal acts. Criminological theories refer to this as a 'reinforcement effect' (e.g., Akers and Jensen, 2003), suggesting our next hypothesis: H6: *With every additional delinquent act*

of the father the over-time diminishment of his child's chance of committing crime is slower (in other words, the decay effect will elapse more slowly) (reinforcement hypothesis).

Additional hypotheses

Insights from the age-graded theory of informal social control (Sampson and Laub, 1990) help us to predict in which period in life fathers have greatest influences on the (criminal) behavior of their children. We derive additional predictions that lead to extra tests of the developmental criminological theories presented above. The age-graded theory of informal social control states that certain changes in the life course modify one's probability of committing crime. That is, different bonds and circumstances play a role in different periods of people's lives. During childhood and adolescence, bonds with parents and success in school are most important. After that, bonds with one's own family (through marriage and having children) and success in the labor market become more important.

We assume, based on the age-graded theory of informal social control, that children's learning of criminal behavior from their parents takes place especially in the periods in which the bond with their parents is strongest. This translates to a high parent-child transmission of criminal behavior and criminal techniques in the period before adulthood, as we assume that the learning effect is larger in this period than in the period after adolescence. We also expect children in adolescence to forget confrontations with parents' criminal behavior less rapidly than during adulthood. Both expectations lead us to propose the next hypothesis: H7: *During adolescence the learning effect is especially large, while the decay effect is especially small* (adolescence hypothesis).

A precondition for learning criminal behavior from fathers is of course fathers' presence in the lives of their children. Many children however experience a divorce of their parents (Fischer, 2004). After a divorce, most children live with their mother (Fischer, De Graaf and Kalmijn, 2005). The father might still play a role in the lives of the children, but he is usually no longer present in everyday life. Children of divorced parents would then (on average) be confronted less with the criminal activities of their father than children whose parents are still married. Thornberry et al. (2009) demonstrate that only fathers who are frequently in contact with their children transmit antisocial behavior. From this follows our expectation that the learning effect is probably smaller for children whose parents are divorced. We also expect children's memory of their father's criminal behavior to fade more rapidly when their father is no longer living in the same household. This leads to our final hypothesis: H8: *The learning effect is smaller after a parental divorce, while the decay effect is larger* (divorce hypothesis).

Previous research clearly shows that disruptions in families can cause problematic behavior among children. However, giving a bad example also leads to criminality among offspring. In fact, the salutary effects of being raised by two married parents depend on the behavior that parents display (e.g., Jaffee, Moffit, Caspi and Taylor, 2003; Blazei, Iacono andMcGue, 2008). The question remains whether children from criminal fathers are less prone to become criminal themselves if their fathers are out of the picture after a divorce.

4.4 Methodology

In this chapter, we will again use the data of the CCLS in order to test our hypotheses. Table 4.1 presents some descriptive statistics of the variables that are used in this chapter. It shows that about half of the children are male. The total number of criminal convictions of fathers over their entire life course varies from 1 to 186, clearly an indication of a large variety of criminal fathers. The average number of children within a family is 2.3 and these children are on average 22.63 years old. After the 12th birthday of the children the fathers were 3.86 times convicted on average. This shows that most of the criminal acts were committed before the children reached the age of 12.

Table 4.1: Descriptive statistics (CCLS children)

	Mean	Range	N
Time-constant variables			
Sex (female=1)	.49	0/1	6,921
Total number of criminal convictions father over the entire life course	10.24	1-186	6,921
Number of children within the family	2.31	1-11	6,921
Time-varying variables			
Age	22.63	12-40	123,630
Number of criminal convictions father after child is age 12	3.86	0-163	123,630
Parental divorce	.65	0/1	123,630
Deceased father	.09	0/1	123,630
Dependent variable			
Criminal conviction in a certain year	.05	0/1	123,630

About 65 % of the children in our data grew up while parents were separated (either due to parental divorce or because these children were born out of wedlock) and about 10 percent were confronted with the death of their father. Divorce and death rates are much higher in this (criminal) group than among children without criminal fathers. On

average, the children get convicted in 5 percent of all years. As the focus in this chapter is on the *timing* of criminal behavior of fathers, the control group will be left out of the analyses in this chapter (as these fathers do not commit criminal acts at all).

We test our hypotheses by means of multilevel logistic regression analysis. Dependent variable will be the likelihood of a conviction in a certain year. Our dataset contains a record for every child for every year after the age of 12. When a child died in a specific year, no records for subsequent years are included. The dataset contains 123,630 person-years for 6,921 individuals (i.e. children). For every year we recorded whether a child was convicted of one or more crimes. Employing the NLMIXED procedure in SAS, we estimate logistic regression models for the chance of one or more convictions in a year.[7] This procedure enables us to model a nonlinear decay function. In addition, it allows us to account for the fact that our observations are not independent, as we study numerous years for the same person. We account for this nested structure of the data (person-years within persons) by means of multilevel analysis. As we know of no software that allows for estimating nonlinear decay functions, while simultaneously accounting for more than 2 levels of nesting, we cannot correct for the fact that siblings are nested within fathers. Nevertheless, we do not expect this to interfere with our conclusions.[8]

We estimate four multilevel logistic regression models. The first model includes the control variables and the static effect of the total number of convictions of the father (testing H1 and H2). Our second model adds the learning effect and the decay effect (testing H3 and H5). In the third model we add the cumulative learning effect and the reinforcement effect (testing H4 and H6). Finally, the fourth model includes the interaction effects of divorce and adolescence (testing H7 and H8). Next, we describe for each of the four models how we test our hypothesized effects.

Model 1

In Model 1 we start with a number of control variables. First, we estimate the effect of age. The chance of a conviction rapidly increases during adolescence, peaks in the early twenties and then gradually decreases (e.g., Gottfredson and Hirschi, 1990; Moffit, 1993). Following Blossfeld and Huinink (1991), we therefore model the age effect with two log

[7] We choose a logistic model instead of a Poisson or negative binomial model, because the numbers of years in which individuals are convicted more than once are negligible.

[8] We estimated Model 1 (in which no nonlinear decay function is included) using the lme4 package in R with 2 levels (person-years nested within persons) as well as 3 levels (person-years nested within persons nested within fathers). The differences in estimated effects were minimal and did not lead to other conclusions (see also appendix 2; Table 4.2b).

variables. The first log variable indicates the gradual decrease after the peak, while the second captures the initial rise. We choose this way of modeling over the traditional method with a quadratic term for age because the age-crime curve is known not to be a symmetric parabola. Blossfeld and Huinink's method does not assume symmetry and requires the same degrees of freedom. Second, we estimate the effect of a having a deceased father, for which 0 indicates that the father is still alive in a specific year and 1 means the father has died. From the literature we know that children whose fathers died have a larger chance of committing crime (e.g., Harper and McLanahan, 2004). Of course, the past criminal behavior of a father who has died can still affect his children's chances of committing crime. Third, we estimate the influence of parental divorce, for which 0 indicates that the parents were still married in a specific year and 1 means the parents had separated (or were never married). We control for divorce because the literature shows that men with criminal tendencies have larger chances of divorce (see Table 3.3 in chapter 3) and because children of divorced parents are more likely to commit crime (McLanahan and Sandefur, 1994). Fourth, we take into account the number of children within a family, as it seems reasonable to expect that children within large families experience less parental control than children in smaller families (Gottfredson and Hirschi, 1990). Finally, we take into account sex, with 1 indicating the research subject is a woman. The literature shows large differences between men and women in the tendencies to commit criminal acts (see also chapter 3).

The key parameter we estimate in Model 1 is the effect of the total number of criminal convictions of the father. Static theories suppose that individuals differ in their tendency to commit crime and that these differences are caused by differences in self control among fathers. In order to account as much as possible for father's level of self control and to test father's crime hypothesis (H1), we count the total number of criminal convictions of fathers. This is our best (though indirect) measure of self control of the father. We assume that the difference between fathers who commit 2 or 3 crimes is more important than the difference between those committing 20 or 21 criminal acts. We therefore use a log transformation of the total number of father's criminal convictions.

Model 2

In Model 2 we estimate, in addition to the parameters of Model 1, the initial learning effect and the decay effect. We assume that the criminal learning process begins when a

father is convicted for the first crime after the child has reached the age of 12.[9] Before that, we model no influence of learning effects. Our 'learning effect hypothesis' (H3) implies that a child's chance of conviction rises in the year the father is convicted for his crime(s). This learning effect is denoted by β_1 in equation (1).

If a father does not commit any crimes in subsequent years, the decay hypothesis (H5) implies that the effect of the first confrontation with father's criminal behavior declines. That is, with every additional year (T) that goes by, the influence decreases. After a certain amount of time a child's chance of conviction is indistinguishable from the original probability. Insights from psychology and biology show that forgetting information or skills usually follows an exponential decay process (Wixted and Ebbesen, 1991). We therefore model our decay effect (β_2) by way of an exponential function.[10]

The equation with the learning effect and the decay effect reads as follows:

$$\ln\left(\frac{P}{1-P}\right) = \beta_1 \cdot \exp\left(-\frac{(T+1)}{\beta_2}\right) + B \cdot X \qquad (1)$$

In equation (1), β_1 denotes the learning effect, β_2 captures the decay effect and T is the number of years since a father was last convicted. We use T +1, because we expect the influence of father's criminal behavior to be realized right away and not a year after the criminal conviction. B denotes the parameter vector belonging to X, the matrix of all other covariates including an intercept.

As hypothesized (H3), we expect a positive learning effect (β_1). A larger value for this learning parameter means that the chance of conviction in a certain year is larger. If H5 holds, we also expect a positive decay parameter (β_2). That is, the chance of conviction decreases as the years pass after father's last conviction. A larger decay parameter would imply a slower decay. That is, the chance of conviction remains higher for a longer period of time when the decay parameter is larger.

[9] Of course this assumption is a simplification of the learning process. Learning could also take place before the age of 12, but we cannot correctly model that learning process due to the nature of our data. However, we assume that criminal learning requires a level of consciousness that is lacking among most children under the age of 12.

[10] Additional analyses (see appendix 2; Table 4.2d) show that the model with the exponential decay function fits the data better than a model with a linear decay function. Besides, compared to a linear function, the exponential decay function offers the advantage of asymptotically approaching the point of departure.

Model 3

Model 3 adds parameters to test whether we find evidence for the cumulative learning effect (H4) and the reinforcement effect (H6). These effects come into play only when a father has been convicted multiple times. For his second conviction, we expect a cumulative effect (β_3) on top of the original learning effect (β_1).

The speed of the decay slows down, according to the theory of Ebbinghaus (1913), every time a person is exposed to the relevant stimulus (in this case, a criminal conviction of the father). We thus expect it to take longer for the chance of a child's conviction to settle at its original value when a father has committed multiple criminal acts. Both the increase in the chance of criminal learning and the decrease of the speed of the decay thus depend upon the number of criminal convictions of the father. Because we again assume diminishing effects (as in our test of father's crime hypothesis (H1)), we include the log transformation of father's number of criminal convictions after the child reached age 12.[11] Model 3, with learning effects, decay effect and reinforcement effect is shown in equation (2):

$$\ln\left(\frac{P}{1-P}\right) = (\beta_1 + \beta_3 \cdot \ln(N)) \cdot \exp\left(-\frac{(T+1)}{(\beta_2 + \beta_4 \cdot \ln(N))}\right) + B \cdot X \qquad (2)$$

In equation (2), β_1 again denotes the learning effect and β_2 the decay effect. β_3 denotes the cumulative learning effect and β_4 the reinforcement effect. T again signifies the number of years elapsed since father's last conviction. N denotes the number of times a father was convicted after the child reached the age of 12. B again is the parameter vector belonging to X, the matrix of all other covariates including an intercept. A positive cumulative learning effect (β_3) would imply a stronger increase of the chance of a child's conviction with every additional criminal conviction of the father. If fathers have a more extensive criminal record, the decay elapses slower and the reinforcement effect (β_4) increases. We thus expect β_4 to have a positive value.

Model 4

In our additional predictions we formulated two hypotheses. First, we suggested that the initial learning effect is larger and the decay effect smaller in years in which parents are (still) together instead of divorced. We therefore estimate an additional learning effect

[11] This log transformation again showed a better fit to the data than a linear function (see appendix 2; Table 4.2c).

for all years that parents are married. Furthermore, we test whether an accelerated decay takes place in the years parents are divorced. Second, we hypothesized that the learning effect is larger in the years children are in adolescence (ages 12 through 19). Decay would be slower in these years. We therefore take a second set of additional variables for the learning effect and the decay effect. Model 4 includes these additional effects and is shown in equation (3):

$$\ln\left(\frac{P}{1-P}\right) = (\beta_1 + \beta_3 \cdot \ln(N) + \beta_5 \cdot D + \beta_6 \cdot Ad) \cdot \exp(-\frac{(T+1)}{(\beta_2 + \beta_4 \cdot \ln(N) + \beta_7 \cdot D + \beta_8 \cdot Ad)}) + B \cdot X$$

In equation (3), β_5 and β_6 denote the additional learning effects of divorce (D) and adolescence (Ad) and β_7 and β_8 signify the additional decay effects of divorce and adolescence. We expect a negative value for β_5, as the effect of learning will be smaller after a divorce. For β_6, we expect a positive value, as the influence of the criminal acts of fathers will be larger during adolescence. We expect a negative value for β_7, as the decay will be faster in the years following a divorce, while we expect a positive value for β_8, because the decay will be slower during adolescence.

4.5 Results

Model 1 in Table 4.2 presents the effects of age, sex, parental divorce, a deceased father, and the number of children within the family. It also tests whether the number of criminal convictions of a father (over his entire life course) predicts the chance of criminal convictions of a child. The results show that both measures used to estimate the age curve are significant. The estimated effects show that the age-conviction curve is asymmetrical. Strikingly, the peak is to the right of the middle (which is at (40 + 12)/2 = 26.0). The peak in the age-crime curve is usually is found in the early twenties, but our finding is likely caused by the official nature of the data used in our research. Many other studies are based on self-reported data or police statistics. Model 1 also shows that women are far less likely than men to get convicted in a specific year. In the years after a parental divorce, children have a higher chance of conviction. A deceased father, however, does not lead to an increase in the likelihood of conviction. The number of children within a family is also unrelated to the chance of conviction.

Table 4.2: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 6,921; $N_{person\text{-}years}$ = 123,630)

	Model 1			Model 2			Model 3			Model 4		
	B		SE	B		SE	B		SE	B		SE
Intercept	-9.40	***	.20	-9.30	***	.30	-9.30	***	.40	-9.37	***	.20
log (Age-11)	1.18	***	.04	1.19	***	.04	1.20	***	.04	1.19	***	.04
log (40-Age)	.80	***	.04	.75	***	.04	.77	***	.04	.76	***	.04
Sex (female=1)	-2.18	***	.08	-2.20	***	.08	-2.18	***	.08	-2.18	***	.08
Parental divorce	.34	***	.06	.32	***	.06	.32	***	.06	.48	***	.07
Deceased father	.05		.07	.13		.08	.11		.08	.11		.07
Number of children within the family	.31		2.10	-.72		2.08	-.08		2.06	-.09		2.06
Log (Total number of criminal convictions father)	.49	***	.03	.40	***	.04	.41	***	.04	.40	***	.04
Learning effect (β1)				.55	***	.12	.98	***	.20	1.16	***	.21
Decay effect (β2)				6.87	**	1.93	1.58		.96	3.13	**	1.00
Cumulative Learning effect (β3)							.09		.20	-.15		.08
Reinforcement effect (β4)							4.57	*	1.93	4.68	*	2.02
Learning effect * Divorce (β5)										-.59	***	.16
Learning effect * Adolescence (β6)										.20	*	.10
Decay effect * Divorce (β7)										.05		.28
Decay effect * Adolescence (β8)										-.63	*	.27
Intercept variance level 2	4.09	***	.17	4.16	**	.17	4.13	**	.17	4.10	***	.17
-2log-likelihood	37,735			37,684			37,685			37,668		

* p<0.05, ** p<0.01, *** p<0.001

The key finding from Model 1 is the large significant effect of the total number of criminal convictions of the father on the chance of a child's conviction in a year. This supports father's crime hypothesis deduced from static criminological theories (H1). Static theories, however, predict not only the presence of an effect of the number of conviction of the father, they also predict the absence of all learning effects. In Models 2, 3 and 4 we test whether these effects are indeed absent.

Model 2 ads the learning and decay effects. The estimated parameter of the learning effect (β_1) is – as hypothesized – positive and significant. In the year a father is convicted for committing crime (and in subsequent years), the chance his child is also convicted increases. The learning hypothesis (H3) is thus supported. The parameter of the decay effect (β_2) is positive and significant as well. As the time since a father was last convicted increases, the chances of a child's conviction decrease (after the initial rise due to the learning effect). The decay hypothesis (H5) is thus also supported by these findings.

The decay parameter (β_2) in Model 2 is 6.87. We can calculate the half-life applying the following equation: $t_{1/2} = \beta_2 \cdot \ln(2)$. The half-life signifies the number of years that pass until the increased chance of conviction is halved. As such, the half-life gives us insight into the speed of decay. Based on the decay parameter from Model 2, we calculate the half-life to be 6.87 * ln(2) = 4.76. This indicates that nearly five years are needed for the initial rise in the chance of conviction to decrease by half. Children whose fathers are convicted thus have an increased chance of getting convicted themselves for quite a long time. Whether this increased chance is indeed caused by learning or by some other mechanism remains unclear. We do, however, find evidence for an exponential decay effect, which is typical in learning/forgetting processes.

In Model 3, the learning process is further specified. The decay parameter in this case indicates a reduction in the chance of conviction after the father's first criminal conviction. The learning effect after the first criminal conviction expires rapidly, according to the small (insignificant) decay parameter. The associated half-life in this case is 1.58 * ln(2) = 1.10. After about a year the increased chance of a criminal conviction is already half the original increase. The reinforcement effect, however, indicates that if a father is convicted more often, there is more reinforcement, meaning less rapid decay. When, for example, a father is convicted for the fifth time, the total decay parameter is estimated to be 1.58 + ln(5) * 4.57 = 8.94. The associated half-life is 8.94 * ln(2) = 6.20. So, it takes (after father's fifth criminal conviction) more than six years before the increased chance of conviction returns halfway between the original chance level and the initial increase.

Figure 4.1a: Learning effects across the life course

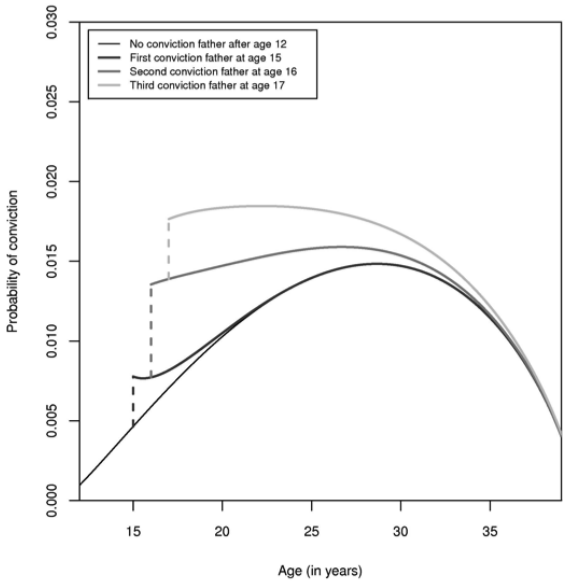
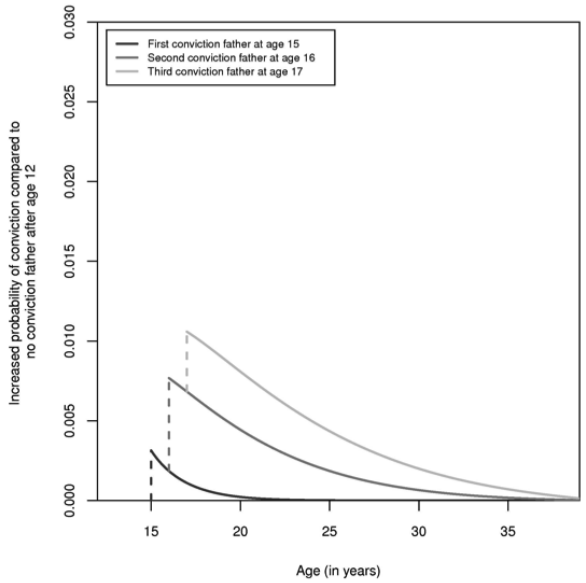


Figure 4.1b: Decay effects compared to age–conviction–curve



We are not able to test whether the reinforcement effect is in fact caused by a learning mechanism, but both the decay effect and the reinforcement effect display similarities to typical learning/forgetting processes.

The initial learning effect (β_1) in Model 3 remains significantly positive, while the parameter for the cumulative learning effect (β_3) is insignificant. The chance of a criminal conviction does not rise more as a father is convicted for his second or third time. Our findings therefore do not support the cumulative learning hypothesis (H4).

Figure 4.1 presents the dynamic effects based on Model 3 (all control variables are set to their mean value). This figure shows (1) the expected criminal conviction career of a child whose father was never convicted after the child reached the age of 12, (2) the expected criminal conviction career of a child whose father was convicted for the first time when the child was 15 years old, (3) the expected criminal conviction career of a child whose father was convicted for the second time when the child was 16 years old, and (4) the expected criminal conviction career of a child whose father was convicted for the third time when the child was 17 years old. We present the complete life courses (4.1a) and the increased chances compared to the original age-conviction curve (4.1b).

Note that the chance of a criminal conviction rises in the years after a father is convicted. In subsequent years, the chance slowly decreases to its original level. Strikingly, the decay from the first criminal conviction (when the child is 15) occurs much faster than the decay from the second and third criminal conviction (reinforcement effect). This is also supported when we calculate the half-lives. The increased chance after father's first criminal conviction has a half-life of $1.58 + \ln(2) = 1.09$. The total decay parameter for children of fathers with three criminal convictions is $1.58 + \ln(3) * 4.57 = 6.06$ and the associated half-life is $6.06 * \ln(2) = 4.20$.

All in all, the results contradict predictions from static theories and offer support for dynamic learning theories. There are indeed effects of the timing of father's criminal convictions. Especially in the years after a father is convicted, the children's chance of conviction is increased. The static hypothesis (H2) is thus rejected.

Additional hypotheses

A test of our additional hypotheses follows in Model 4. This final model estimates the additional learning and decay effects for adolescents and for those whose parents are divorced. Our expectation was that the learning effect would be larger in adolescence and when the parents were (still) together, while the decay effects would be smaller (H7 and H8). Results show that the learning effect after a divorce (β_5) is indeed significantly smaller for people whose parents are divorced than for those whose parents are married. This means that in the year a father is convicted, the chance of conviction for his

children increases to a smaller extent when the parents are divorced than when parents are (still) together. Although divorce on its own increases the chance for a child to get convicted, divorce moderates the negative effect of a criminal father. In some cases, divorce protects children from exposure to a criminal father, which leads to a reduced chance of conviction. These findings are in line with findings of Jaffee et al. (2003) and Blazei et al. (2008).

The learning effect in adolescence (β_6) is significantly positive, which is in line with our expectations. In adolescence, when bonds with parents are relatively strong, the learning effect of a criminal conviction of the father is larger than in adulthood. The decay effect parameter for those with divorced parents (β_7) is insignificant. This means that decay occurs at the same speed for those with married parents as for those whose parents are divorced. For adolescents, however, the parameter (β_8) is significantly negative. This means that the decay goes faster during adolescence than among adults. This is contrary to our expectations. We therefore have to reject parts of our divorce hypothesis (H7) and our adolescence hypothesis (H8). We find additional effects of parental divorce and adolescence on the learning effect, but not (at least not in the expected direction) on the degree of decay.

4.6 Conclusions

This chapter addressed the question to what extent static and dynamic theories explain the relation between criminal careers of fathers and their children. In order to do so, we investigated the influence of the timing of paternal criminal convictions on the development of criminal careers of children. This chapter contributes in numerous ways to advance knowledge in the field of intergenerational transmission of crime. First, we introduced a new research topic to the field of the intergenerational transmission of crime by investigating the influence of the timing of fathers' criminal convictions on the development of a criminal career of their children. Second, we explicitly tested competing explanations regarding the intergenerational transmission.

In this chapter, we tested hypotheses from two paradigms: population heterogeneity and state dependence. We first tested predictions from static theories, which assume that criminal behavior is explained by persistent heterogeneity. The general idea is that only circumstances in early childhood can influence children's criminal behavior. Self control theory, one of the most important static theories, holds that a relation does exist between the number of criminal acts of a father and those of his children, but this relation would be spurious. Fathers who commit a lot of crime have little self control and as a result are inadequate child-raisers. Consequently, their children

grow up having little self control and committing crime as well. The timing of criminal acts of fathers should not matter whatsoever, according to static theories. Second, we introduced predictions from dynamic theories, which state that numerous life course changes (also after early childhood) influence the chance of committing crime. Dynamic theories do also predict an influence of the timing of fathers' criminal acts.

Our findings show support for population heterogeneity. The life courses of children appear to be influenced to a large extent by the total number of criminal convictions of their fathers. In addition, however, there are clear effects of the timing of fathers' criminal convictions. Thus, the process of state dependence is also important in predicting the development of criminal behavior. The results demonstrate that the chance of conviction rises in the years in which fathers are convicted for committing their crimes (the learning effect). This effect diminishes with time (the decay effect). With each subsequent criminal act the decay is however slower (reinforcement effect). The learning effect is smaller after a parental divorce, when children usually interact less with their father. The learning effect is stronger in adolescence, when bonds with fathers are generally more important than during adulthood. Other studies (e.g., Thornberry et al., 2009; Bijleveld and Wijkman, 2009) also suggest the importance of including interaction between parents and their children (e.g., frequency of contact) for understanding the transmission of criminal behavior from one generation to the next. All in all, the results show support for a theory in which both population heterogeneity and state dependence processes are incorporated.

Although hypotheses derived from static theories are partly corroborated in the present study, as in chapter 3, the claim that life course circumstances do not influence the development of criminal behavior has to be rejected. Previous authors point out that the static viewpoint on the development of criminal behavior is a simplified rendering at best (Blokland, 2005; Tittle, Ward and Grasmick, 2003). Although this chapter already provides valuable insights, more research is needed to thoroughly establish the intergenerational transmission of convictions. In the following chapters of this thesis, we will therefore focus on the influence of parental divorce, paternal imprisonment and the convictions of mothers and siblings on the development of individual criminal life courses.

Chapter 5

Parental divorce in criminal families: a second test of static and dynamic theories of crime

5.1 Introduction

It is not at all unusual for a child to grow up in a single parent-family nowadays (Fischer, 2004). For that reason, the negative consequences of parental divorce and the absence of a parent on the wellbeing of children have been extensively researched in the last few decades (Furstenberg & Teitler, 1994; Juby & Farrington, 2001; Rebellon, 2002). Several studies (e.g. Amato & Gilbreth, 1999; Loeber & Stouthamer- Loeber, 1986; Veenstra, Lindenberg, Verhulst & Ormel, 2009) show rather consistently that children from broken homes display more problematic and criminal behavior. Children from broken homes have a higher chance of offending (Juby & Farrington, 2004), of convictions (Haas, Farrington, & Sattar, 2004), and a higher chance of incarceration (Harper & McLanahan, 2004; Apel & Kaukinen, 2008). All in all, children appear to commit less crime when raised in families with two married parents.

In this chapter, we will take our investigation of the intergenerational transmission of convictions a step further. We will focus on the influences of parental divorce on the development of individual criminal careers. Also, we will improve upon the previous research focusing on the influence of parental divorce. Up until now, there are two major shortcomings in the current literature on the effects of parental divorce on the criminal behavior of children.

The first shortcoming of the current literature is that almost all research in this area focused solely on associations between certain family types (married family, single-parent-family) and the children's criminal behavior rather than on changes in the family structure. Studying the influence of the change in the family situation will allow for more insights in the causal influence of parental divorce on the criminal convictions of children. Some theories state that the influence of parental divorce on criminal convictions is causal (e.g., Sampson and Laub, 1990), while other theories state that the association rests solely on selection (e.g., Gottfredson & Hirschi, 1990). According to this last group of theories, some families have larger chance to experience a divorce as well as to commit crimes. Our longitudinal approach will allow for a test of these two opposite theoretical assumptions.

A second drawback of the current literature is that it largely ignores the possibly different effects of parental divorce on the criminal convictions of children in families in which parents commit criminal acts themselves. Consequently, it remains unclear whether divorce is as unfortunate in criminal families as it is in non-criminal families. Research shows that the salutary effects of being raised by two married parents on criminal behavior could very well depend on the behavior that the parents display (Blazei, Iacono, & McGue, 2008; Jaffee, Caspi, & Taylor, 2003). In this chapter, we will

explicitly take the criminal behavior of fathers into account while estimating the effects of parental divorce on the development of criminal convictions of children.

Our aim is to improve upon the two major shortcomings of the previous studies. We will do this in the following ways: First, we investigate whether it is more likely that the effect of parental divorce would be causal or due to selection effects. Using multilevel models with random intercepts and fixed effect panel models, we investigate whether the chance of a child to commit crime rises after experiencing the divorce of his parents. We will do so by analyzing longitudinal panel data, appropriate to follow individuals and their criminal behavior over time. The most central research question we address thus reads: *To what extent does parental divorce affect the subsequent criminal convictions of individuals?*

The second improvement we will make upon previous studies is by investigating whether the influence of divorce is different in families with criminal parents than in families with law-abiding parents. Our second research question therefore reads: *To what extent does the impact of parental divorce on subsequent criminal convictions of individuals depend on the criminal convictions of fathers?*

5.2 Previous research

Previous studies investigating the relation between parental divorce and children's criminal behavior mostly compare behavior of children in disrupted families with the behavior of children in other families. Results show that children from broken homes show more problem behavior (Amato & Gilbreth, 1999). Also, children in high-conflict families show higher chances of offending (Juby & Farrington, 2001). For example, a study with 21314 Swiss male recruits reports that family disruptions as well as family conflict predict offending (Haas et al., 2004). Another tradition of studies focuses on the effects of divorce versus death as cause of the single parent family. Disruptions caused by parental disharmony seem more damaging than disruption caused by parental death (Juby & Farrington, 2001; Wells & Rankin, 1991). All previous studies (Amato & Gilbreth, 1999; Loeber & Stouthamer- Loeber, 1986) show rather consistently that children from broken homes display more problematic and criminal behavior. Wells and Rankin report an increase in delinquency of 10 % to 15 % in their meta-analysis of 50 studies. Rebellon (2002) suggests an even higher increase. These studies, however, neglect to investigate the influence of the parental divorce in criminal families. Furthermore, they do not investigate the influence of parental divorce on the developments of children's criminal careers.

To our knowledge, only a few studies have explicitly focused on the influence of divorce on long-term developments of criminal behavior of children. Studies which did examine developments, analyzed the effects of family configurations on the development of criminal behavior of children. We will describe the most important longitudinal studies. Van der Valk et al. (2005) for instance, looked at the long-term differences in behavior problems of 1,274 adolescents in intact and broken families in the Netherlands. The most important result of their study is that behavior problems occur more frequently among broken families (Van der Valk, Spruijt, de Goede, Maas, & Meeus, 2005). Another study examining delinquency in a sample of 417 15-year old Canadian boys also shows differences in delinquency patterns between children of broken families and children of whom the parents remained married. The study shows evidence of considerably more theft and fighting at earlier ages among children from broken homes than among peers from families that had remained intact (Pagani, Tremblay, Vitaro, Kerr, & McDuff, 1998). A study of Mednick, Baker & Carothers (1990) reports that divorce does have long-term negative effects on the criminal behavior of children. Family instability and parental crime both had independent effects. All in all, research shows that children growing up in broken families face long-term consequences for the development of their criminal behavior.

Next to the question whether parental divorce has a causal impact on the criminal careers of children, we pose the question whether the effect of parental divorce is different in criminal and in non-criminal families. In only few studies on the effects of parental divorce, the criminal behavior of parents is taken into account (e.g., Mednick, Baker, & Carothers, 1990; Mednick, Reznick, Hocevar, & Baker, 1987). In most of these studies, criminal behavior of parents is treated as an explanation for their divorce. Results show that the relation between divorce and the criminal behavior of children are (at least to some extent) explained by the criminal behavior of fathers. Other studies investigate whether the salutary effects of being raised by two parents are equally beneficial if (at least) one of the parents is committing crimes. Parental divorce in most cases leads to less contact with the father (Fischer, 2004; McLanahan & Sandefur, 1994), who is the criminal parent in most cases as well. Hence, children will have less contact with the criminal parent after a divorce. Results from a study by Jaffee at al., using a sample of 1,116 5-year old twin pairs and their parents show that when fathers engage in high levels of antisocial behavior, children appear to have more conduct problems if they lived more time in their presence. The results even suggest that these children would have been better off without their criminal parent (Jaffee et al., 2003). Another study of Blazei, Iacono and McGue (2008) with a sample of approximately 1,500 11- and 17- year-old twins shows that both a parent's tendency to commit crimes as parent's presence in the household increases the chances of children's criminal behavior. The association

between parent and child's behavior appears to be stronger when the criminal parent was present in the household for a longer period of time. Again, children committed fewer crimes, when criminal parents were not present. Recent results of the Rochester Youth Development Study also show that the contact between the parent and child is an important factor in the transfer of risk (Thornberry, Freeman-Gallant & Lovegrove, 2009).

The results of chapter 4 of this thesis also show that the influence of paternal criminal convictions is smaller in families where the father is no longer present in the household. Children growing up in single parent and broken families experience a smaller impact of the paternal criminal convictions on the chances of committing crimes themselves. In this chapter, the focus will be on the causal effect of divorce. On top of that, we will investigate once more whether this effect differs between criminal and non-criminal families.

Shortcomings of previous studies

Although the studies mentioned provide valuable insights in the influence of growing up in broken homes on the development of criminal behavior, the designs of these studies know some limitations. First, most designs focus on small samples (often around 400 subjects) which makes advanced statistical testing difficult. Second, the studies lack a long follow-up period or only investigate the development of a very small part in the life course. Third, most studies focus on externalizing or problematic behavior and not on criminal convictions. It is thus unclear, to what extent divorce also influences the more serious forms of criminal behavior. Fourth, only very few studies explicitly analyze the influence of divorce in criminal families. In fact, we know of no studies that look at the long-term effects of parental divorce in those families. Finally and most importantly, none of the studies focuses on the transition of divorce on the development of criminal convictions. In most cases the studies focus on associations between the family structures and the children's criminal behavior, rather than on changes within the family structure. The causal impact of divorce therefore remains untested. In this study, we will improve upon all these shortcomings.

5.3 Theories

In this chapter, we will use the same theories as we used in chapters 3 and 4. First, we will present the expectations of static theories of crime. Static theories assume no causal relation between parental divorce and criminal convictions of children. According to static theories, the relation between parental divorce and criminal convictions of children

is solely due to selection effects. Static theories assume that some individuals possess specific personal characteristics that lead to both a higher chance of getting divorced as well as to a higher chance of unfortunate upbringing of the children. Second, we present expectations of dynamic theories of crime. According to dynamic theories, parental divorce would alter the chances children have to commit crimes. Dynamic theories thus assume a causal effect of parental divorce on the criminal convictions of children.

Static theories

According to the most important static theory -Gottfredson and Hirschi's self control theory- people with limited self control display more risk-taking behavior, are relatively short-minded, and aim at immediate gratification. They are more likely to display all sorts of unadjusted behavior like promiscuity, alcohol and drug abuse, and criminal behavior. Little self control thus results in a higher chance to commit crimes. Also, people with little self control lack the skills and persistence to remain married to the same spouse, resulting in a high divorce-rate among them. Consequently, according to static theories, criminal convictions and divorce will go hand in hand, but are not causally related.

Static theories do not assume that parental divorce itself is responsible for the criminal convictions of children. However, when parents have little self control, their behavior will be oriented towards immediate gratification, resulting in insufficient parenting skills. They will not consequently control, recognize and punish deviant behavior of their young children and therefore cause their children to have a low level of self control as well. Parents with little self control thus have, on the one hand, a high probability to get divorced, and on the other hand, a high probability to have children with little self control (and who subsequently have a high probability of committing crime). According to self control theory, the relation between parental divorce and criminal convictions of children is therefore spurious and could be explained entirely by the level of self control of the parents. The first hypothesis thus reads: H1: *Parental divorce does not causally influence the chance of children to have criminal convictions* (selection hypothesis).

Dynamic (learning)-theories

The most important dynamic theory -the age-graded theory of informal social control- (Sampson & Laub, 1990;1993) states that certain changes in the life course modify one's probability of committing crime. More specifically, different bonds and circumstances play a role in different periods of people's lives. During childhood and adolescence,

bonds with parents and success in school are most important. After that, bonds with one's own family (through marriage and having children) and success in the labor market become key. The age-graded theory of informal social control predicts that parental divorce will lead to less parental supervision due to the absence of one of the parents (generally the father) (Sampson & Laub, 1990;1993). After a divorce, children usually continue living with their mothers (Fischer, De Graaf, & Kalmijn, 2005; McLanahan & Sandefur, 1994). Divorce will thus often lead to a weaker emotional attachment to the father, because the father has moved away. In some cases, fathers will remain totally absent after a divorce, resulting in (feelings of) paternal rejection. Moreover, bonds with mothers will often also be challenged, because mothers will have to do all the parenting by themselves. Furthermore, divorce often leads to a decline in available financial resources. These factors all combined will lead to weaker bonds with the parents. This will result in higher chances of committing crime amongst children after a parental divorce.

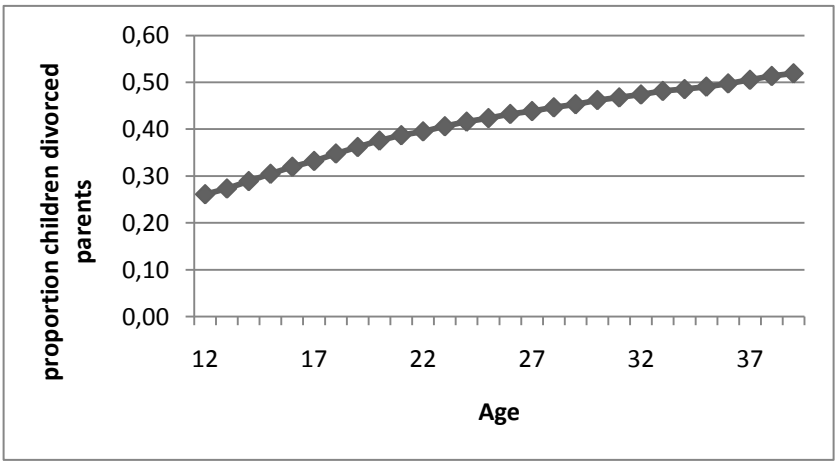
The age-graded theory of informal social control thus predicts a causal influence of parental divorce on the development of criminal behavior of a child. The second hypothesis thus reads: H2: *Children who experience parental divorce have a higher chance to have criminal convictions in the years following the divorce* (Divorce causation hypothesis).

Another dynamic criminological theory (differential association theory) provides arguments for the way in which divorce will influence criminal convictions of children within criminal families. Differential association theory (Sutherland, Cressey & Luckenbill, 1992; Akers & Jensen, 2003) assumes that criminal behavior is learned in exactly the same manner as normal behavior is learned. Learning will take place in intimate groups, like the family. Consequently, the stronger the bond people have with their criminal parents, the higher the chance to commit crime. In order for the learning to be effective, the regular presence of the criminal parent (generally the father) is required. However, after a divorce, fathers generally are no longer around every day. We therefore expect the learning-process to be less effective after a divorce. The positive influence of divorce, leading to a higher chance of criminal acts among children, is therefore expected to be smaller in families with a criminal father. Indeed, in those families, the learning of criminal behavior will be incensed; leading to a relatively smaller impact of the criminal behavior of the father on the chance a child commits crime. All in all, divorce will be less unfortunate in families with a criminal father. Previous research already provided some support for these assertions (e.g., Jaffee, et al., 2003; Blazei et al., 2008). This leads to our third and final hypothesis: H3:*The effect of parental divorce on the chance of criminal convictions of children is smaller in criminal families than in non-criminal families* (Crime-divorce hypothesis).

5.4 Methodology

Also in this chapter, we will use the data of the Criminal Career and Life course Study (CCLS). In this chapter we will not only use information about the criminal convictions of fathers and children but also about the parental divorce. The information of the divorce and the exact timing of divorce were found in the population registration data. Within these data the exact dates of marriages and divorces are stored. It is important to notice that for some children, parents were never married (16 % in the CCLS group and 5 % in the control group). In these cases, the father did acknowledge the child as legally his. Consequently, it is both possible that parents were living together unmarried or that parents never lived together and were already separated at the time of the birth. We will treat the children born out of wedlock as a separate category in our analyses, as these children were never at risk of experiencing a formal divorce. All other children were born while parents were married and thus were at the risk of experiencing a parental divorce. We will not be able to test whether parental divorce leads to criminal convictions among children under the age of 12, because in the Netherlands, children cannot be convicted for crimes committed before that age. After the age of 12, we are able to analyze whether or not a divorce leads to a higher likelihood of a conviction. However, most parental divorces occur before the age of 12. In our research population of 7987 children, 26.1% experiences a parental divorce before they celebrated their 12th birthday and 15,1 % of the children experience a divorce after their 12th birthday. Although the majority of the divorces takes place before the period of our research, enough divorces after the 12th birthday to remain in order to test our hypotheses. In figure 5.1 the cumulative proportion of children who have experienced a parental divorce is plotted.

Figure 5.1: Proportion children with divorced parents by age



Limitations

The data of the CCLS have several limitations (see also chapter 2). Particularly for this chapter, we mention two additional limitations. The first limitation we notice is that as the CCLS is an administrative sample, it only includes those individuals that were arrested and convicted of a crime, which is a select group of criminals. As this selection for sure causes an underestimation of the true amount of criminals as well as the true amount of crime, the influence of parental divorce on criminal convictions of children (if found) will likely be an underestimation as well. The underestimation of this dependent effect (criminal convictions of children) could influence our results and for example lead to an underestimation of the associations.

A second limitation has to do with the operationalization of parental divorce. Though we study the influence of parental divorce on the developments of criminal careers of children, in this study we do not investigate the duration of divorce. Of course, one could imagine that the influence of a parental divorce is not as large when it occurred 15 years ago. However, the consequences of divorce (growing up in a single parent family) will remain present.

Analytic Strategy

In order to test our hypotheses we will estimate two types of models. Our first set of analyses consists of multilevel models with random intercepts. The second set of analyses consists of a fixed effect panel model (also in a logistic form), which will allow for a more stringent test of the selection-hypothesis (H1) vis-à-vis the divorce causation-hypothesis (H2). These fixed effect panel models, however, cannot provide separate estimates of effects of stable covariates (as sex of the child). In order to provide both estimates of stable covariates and to allow for the strength of fixed effect panel models, we apply both multilevel models with random intercepts as well as fixed effect panel models.

We first investigate the development of criminal convictions by conducting a multilevel logistic regression model that evaluates the odds of a conviction in a given year. Our data file contains a record for every child for every year after the 12^{th} birthday. When a child died, no records after the death were included. The file contains 140,114 person-years and 7,987 individuals nested within 3,500 fathers. For every year we analyze whether a child was convicted for one or more criminal acts (1) or not (0). We estimated multilevel logistic regression models for the likelihood of a conviction in a year. We account for the clustering of multiple years (1) within children (2) by estimating 3-level random intercept models.

The purpose of this first step in the analyses is to determine whether the chance of a child to have a conviction will be higher in the years (directly) following a parental divorce. We estimate the effect of divorce (divorce dynamic) which is coded 0 in the years parents are married and will turn 1 in the years following a divorce. As self control theory states that an effect of divorce (after childhood) would be spurious and explained entirely by differences in self control between fathers, we try to capture the differences in self control with two measures. As a first step, we will control for the number of convictions of fathers (an assumed consequence of self control). Fathers with little self control will commit more criminal acts, than fathers with much self control. The number of criminal convictions of fathers could therefore be seen as a proxy measure of self control of the father. We use the logarithm of the total number of criminal acts[12] as this measure is much skewed (with many fathers having 0 or 1 convictions and very few fathers having more than 100 convictions). Also, we expect the difference between fathers who have 0 convictions and fathers who have 1 conviction to be larger than the difference between 25 or 26 convictions. Next to the number of convictions of fathers as a proxy of self control, we will use a second proxy measure of self control: we estimate whether parents were ever divorced during the entire period under study (0 = never divorced, 1= ever divorced). This time-invariant measure captures inter-family differences in which conflict resulted (sooner or later) in a divorce. Families which face a divorce at some time, have a lower amount of self control. Including this measure allows for testing whether an effect of parental divorce on the likelihood of a conviction remains even when controlled for the fact that some families simply have a much higher chance to experience a divorce.

Although we include two proxy measures (number of criminal acts of the father and ever divorced) that should capture the concept of self control as much as possible in the multilevel models with random intercepts, it is very likely that some of the heterogeneity in self control remains unobserved. Although the multilevel models with random intercepts provide clear insight into substantial differences in the likelihood of offending and how they relate to static and dynamic factors, these models cannot serve as the most stringent test for causality. Therefore, we need to take our analysis one step further. In order to exclude all unmeasured heterogeneity, we need to exclude all inter-individual differences and focus on the intra-individual differences before and after divorce. This will put the selection-hypothesis (H1) and the divorce causation-hypothesis (H2) to the ultimate test, because it tests whether a change in parental marital status is followed by a change in the likelihood of offending. For this purpose, we use fixed effect panel models. The fixed effect panel model will compare the likelihood of a conviction of

[12] We added 1 as the logarithm of 0 does not exist

an individual before the parental divorce with the likelihood of that same individual after the parental divorce. Of course, we will control for the age of the children. The strength of this method is that it does not rely on comparing children in divorced families with other children; it therefore substantially reduces the problem of the selection bias and should enable us to truly test the selection-hypothesis (H1) vis-à-vis the divorce causation-hypothesis (H2) (Allison, 2009). The fixed effect panel model will only use time-varying predictors and will reduce the sample size to a large extent as all individuals with only positive or only negative outcomes (that is convictions of the child in a certain year) will be deleted. It is important to stress that fixed effect models rely on the assumption that the level of unobserved heterogeneity remains stable over period under study. We believe the use of these models is warranted as Gottfredson and Hirschi (1990) make exactly this assumption in their general theory of crime. According to them, self control is formed before the age of 12 and remains stable thereafter.

Measurements

In the analyses we will estimate the effects of several control variables. First, we control for the nonlinear effect of age. We model the age effect with two log variables (Blossfeld & Huinink, 1991). Because many studies have shown an asymmetric age-crime curve (it would rapidly increase during adolescence, peak in the early twenties and then gradually decrease (cf. Gottfredson & Hirschi, 1990; Moffit, 1993), the use of two log variables will probably fit the data better than simply including a linear and a quadratic age term. The first log variable (log(age-11) indicates the gradual decrease after the peak, while the second (log(40-age) captures the initial rise. Our procedure using the two log-variables does not assume symmetry and requires the same number of degrees of freedom. In fact, it even allows for a formal test of symmetry. In case of symmetry, both parameters should be of equal size. Second, we estimate the effect whether a father died during the period under study. All records score 0 when the father is (still) alive and 1 after the father has died. Some studies find that children whose fathers died have a higher chance of committing crime (e.g., Harper & McLanahan, 2004). Third, we take into account the number of children within a family, as it is reasonable to expect that children within larger families experience less parental control (Gottfredson & Hirschi, 1990).

Fourth, we distinguish women (1) from men (0). The literature shows that men are much more likely to be criminal than women (see also the results of chapter 3 and 4). Furthermore, we will take into account whether parents of children were unmarried at the time of their birth. These children were never at risk to experience a parental divorce.

Table 5.1: Descriptive statistics (CCLS children and control children)

	CCLS children			control children		
	Mean	Range	N	Mean	Range	N
Time constant variables						
Sex (Female)	.49	0/1	6921	.47	0/1	1066
Total number criminal convictions father	10.31	1-186	6921	0	0	1066
Number of children within a family	2.31	1-11	6921	1.80	1-11	1066
Parents ever divorced	.48	0/1	6921	.18	0/1	1066
Born out of wedlock	.17	0/1	6921	.05	0/1	1066
Father convicted	1	1	6921	0	0	1066
Time variant variables						
Age	22.63	12-40	123630	21.74	12-40	16484
Divorce dynamic	.42	0/1	123630	.14	0/1	16484
Death Father	.08	0/1	123630	.05	0/1	16484
Dependent variable						
Conviction (of a child) in a certain year	.05	0/1	123630	0.01	0/1	16484

Children born out of wedlock are coded 1, and children born into a married family are coded 0. Finally we estimate the effects of divorce dynamic (0 in years parents are married, 1 in the years parents are divorced) and ever divorced (1 in all the years if parents divorce at one point in time, 0 in all the years if parents never get divorced). Also, we estimate the effects of a logarithm of the number of convictions of fathers and the effects of an interaction between divorce dynamic and whether or not fathers have been convicted (0/1). Table 5.1 shows all descriptive statistics.

Table 5.1 shows important differences between the CCLS children (with a criminal father) and the control children (with a law-abiding father). The percentage of parents who get a divorce is much higher in the CCLS group. In the control group 18% of the children experience a parental divorce, while in the CCLS group this percentage is 48. Children in the CCLS group are born out of wedlock in about 17% of the cases, while children in the control group this percentage is only 5 %. Growing up with unmarried parents is much more common for children in the CCLS group than for children in the control group. Table 5.1 also shows that the chance of a conviction is much higher in the CCLS group (about 5 % in a certain year) than in the control group (about 1 % chance in a certain year).

5.5 Results

In Table 5.2 we present the results of our multilevel models with random intercepts (model 1) and the results of the fixed effect panel model (model 2). We estimate the chance of a conviction within a certain year using logistic regression analysis. In model 1, the two age-measures are both significant. The results show that the age-crime curve is asymmetrical. Strikingly, the peak is to the right of the middle ((40 + 12)/2 = 26). This is extraordinary (but confirms the results of previous chapters), since the peak usually is found in the early twenties. This finding could be caused by the official nature of the data used in our research, as many other studies are based on self-reported data or police statistics. Model 1 also shows that women are less likely than men to have a conviction in every year.

Death of a father, however, does not lead to an increase in the chance of a criminal act; neither does the number of children in a household. The most striking result in model 1 is the effect of out of wedlock. The odds for children born out of wedlock to get a conviction is about eight times as high than the odds for children born into a family with two married parents.

Table 5.2: Multilevel logistic regression models (with random intercepts) of criminal conviction in a certain year (N_{person} = 7,987; $N_{person\text{-}years}$ = 140,114)
Fixed effect panel models of criminal conviction in a certain year (N_{person} = 2,084; $N_{person\text{-}years}$ = 41,189)

	Model 1			Model 2		
	B	SE	Exp (B)	B	SE	Exp (B)
Intercept	-10.03 ***	.24				
log (age-11)	1.21 ***	.04	3.35	1.21 ***	.04	3.35
log (40- age)	.80 ***	.06	2.23	.73 ***	.04	2.07
Sex (Female=1)	-2.16 ***	.09	.12			
Number of children within the family	.02	.02	1.01			
Log (Total number of criminal convictions father)	.59 ***	.03	1.80			
Deceased father	.03	.10	1.02	-.10	.11	.90
Born out of wedlock	2.10 ***	.30	8.17			
Divorce dynamic	.72 ***	.22	2.05	1.23 **	.51	3.4
Ever Divorced	.02	.11	1.02			
Divorce dynamic * criminal father	-.31	.22	.73	-.93 *	.52	.40
Out of wedlock* criminal father	-1.22	.31	.30			
Intercept variance level 2	1.89 ***	.03				
N (years)	140114			41189		
N (persons)	7987			2084		

* p<0.05, ** p<0.01, *** p<0.001

Model 1 furthermore shows that the number of convictions of a father has a strong positive effect on the chance a child commits crime. As a father commits more crime, the chances of a conviction for the children rise as well. Whether or not parents will ever divorce (the second proxy for self control) does not significantly influence the chances of criminal convictions of children.

The most important result from model 1 is that the effect of divorce dynamic is significant. The positive parameter of divorce dynamic indicates that in the years after a parental divorce, children have a higher likelihood to commit crime. Compared to children whose parents did not divorce, the odds for children who experienced a divorce is about 2 times higher. Thus, after experiencing a parental divorce, children are much more likely to have a convictions than in the years preceding the parental divorce. This effect is controlled for the age of the children, for the total number of criminal acts of a father and for the fact whether or not parents will divorce in some point in time. The results thus indicate that even when we control for the fact that parents differ in the amount of self control, we still find a large and significant effect of the transition of parental divorce on the chances children have to have a convictions. These results give strong indications that parental divorce indeed causally influences the chance of criminal convictions of children. These findings challenge the static theories and the selection-hypothesis (H1) and affirm the dynamic theories and the divorce causation-hypothesis (H2).

We also added interaction-effects between the dynamic divorce effect and whether or not fathers were convicted, in order to test the crime-divorce hypothesis (H3). Also we added an interaction between out of wedlock and whether or not fathers were convicted. The crime-divorce hypothesis (H3) reads: The effect of parental divorce on the chances of criminal convictions of children is smaller in criminal families than in non-criminal families. The parameter of the interaction in model 3 is negative, but not significant. The interaction between out of wedlock and whether or not fathers were convicted is not significant either. These findings indicate that there exists little difference in the negative impact of divorce between criminal and non-criminal families, according to the results of the multilevel models with random intercepts models. This contradicts the expectations of the dynamic learning theories. Also, it contradicts findings from previous research (also with data of the CCLS).

The final step in this chapter will put the selection versus causation hypotheses to the most stringent test. In model 2 the results of the fixed effect panel model is shown. As a result of the method of fixed effect panel models, 98925 years within 5903 individuals were deleted because these individuals did not start committing crime (no change in outcome or independent variables). All individuals whose behavior does not change over time are thus omitted. Also, all time-invariant variables are omitted from the

model. Therefore, only the age-variables, death of a father, divorce dynamic and the interaction of divorce dynamic with whether or not a father was convicted remain. The model shows comparable parameter estimates for the age-variables as we have seen before. Death of a father does not influence the chances to have a conviction in the fixed effect panel model either. Most importantly, parental divorce has, even in the fixed effect panel models, a significant, positive influence on the chances a child has of a conviction. Also, the interaction between the parental divorce and whether or not fathers are convicted has a significantly negative effect. Thus, the odds for children to have convictions in families without criminal father is about 3,5 times higher after parents get divorced. However, in families with a convicted father, the odds is only (Exp(1.23-.93)= 1.4) times higher after a parental divorce. These results give support to the divorce causation-hypothesis (H2). Children appear to have higher chances to have a convictions in the years after their parents are divorced. The results also give support for the crime-divorce hypothesis (H3). In criminal families, the effect of divorce is smaller than in non-criminal families.

Having established the significantly positive effect of parental divorce on the likelihood of criminal convictions of a child in the fixed effect panel models as well, allows for the rejection of the selection-hypothesis (H1). Results strongly indicate a causal effect of parental divorce on the chance of a criminal conviction of a child. The results thus give support for the divorce causation-hypothesis (H2) and the dynamic theories of crime. Life events, as experiencing a parental divorce, can change the criminal career of an individual. Also, we find some evidence for the crime-divorce hypothesis (H3) in our fixed effect panel models. In the multilevel models with random intercepts, however, we did not find a different effect of divorce in criminal and non-criminal families. The cause for this difference could probably be found in the selection of the individuals in the fixed effect panel models (as in fixed effect panel models all individual who remain stable are omitted).

5.6 Conclusions

In this chapter, we analyzed the influence of parental divorce on the development of individual criminal careers. The aim of this chapter was twofold. First, we investigated the existence of a causal influence of parental divorce on the development of criminal convictions of children. Second, we investigated whether divorce had different effects in families with and without criminal fathers. This study is the most large-scaled research on the influence of divorce on the criminal convictions of children ever executed and the first to look at the influence of the transition of divorce on the development of criminal careers of children.

Addressing the topic of parental divorce enabled us to test rivaling explanations from both static as well as dynamic theories of crime against each other. In this chapter, we again tested hypotheses from the static and the dynamic theories, as we did in chapter 4. First, we tested predictions from the static theories of crime, which assume that only circumstances in early childhood can predict criminal convictions. According to static theories the association between parental divorce and the number of convictions of children would be spurious. Second, we tested predictions of dynamic theories, which state that a parental divorce leads to a decline in parental support, contact with one parent and economic decline. Hence, in the years after a divorce, chances for children to have a conviction will be higher. According to dynamic theories, the effect of divorce will be different in non-criminal families than in criminal families. Children whose fathers commit a lot of crime could be better off if they were not exposed any longer to the criminal convictions of fathers.

The results of this chapter again give most support to the dynamic theories. We found strong and significant evidence of the transition of parental divorce on the chance children have to have a convictions. These findings were found using multilevel logistic regression analyses with random intercepts and were replicated with the most stringent test using fixed effect panel models. In the years following a parental divorce, the chances for a child to have a conviction are higher than in the years preceding the divorce. While using fixed effect panel models, we ruled out the possibility that the effect of the transition could be explained by a selection effect to a large extent. The claim of the static theory that the relation between parental divorce and criminal convictions of children is based solely on selection was refuted in this study. Both the results of chapter 4 as the results of the present chapter refute the notions of the static theories. The claim that life course circumstances do not influence the development of criminal behavior has to be rejected again. Results give most support to a theory in which elements of both population heterogeneity as well as state dependence are incorporated.

In the multilevel logistic regression analysis with random intercepts, we did not find evidence that the effects of divorce differ as the criminal behavior of fathers differs. According to our multilevel models with effects, the effect of parental divorce is similar in criminal and non-criminal families. However, in our fixed effect panel model, we did find evidence for different effects of divorce in criminal and non-criminal families. According to this analysis, the effect of paternal divorce is higher in non-criminal families. In criminal families, the effect of parental divorce is smaller. This could be due to the fact that in criminal families, a divorce leads to less contact with a criminal father. In such a context, parental divorce will not be such a bad thing. Because of the contradicting results of the multilevel models with random intercepts and the fixed effect panel models, more research is needed to come to more conclusive results.

In this chapter, we do not investigate duration-effects of divorce. Of course, the effect of divorce will likely to become smaller after a period of time. One would expect especially large effects of divorce in the years directly following the divorce. Future research should focus on the duration-effects of divorce.

In this chapter, we focused on the influence of parental divorce on the development of criminal careers of children. The results of this chapter increased our insights about the intergenerational transmission of convictions. Also, we were able to put the static and dynamic theories to a second test. In the following chapters of this thesis, we will focus on additional aspects of the intergenerational transmission of convictions: paternal imprisonment and convictions of other family members.

Chapter 6

The long-term effects of paternal imprisonment on criminal trajectories of children

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6.1 Introduction

The results of the previous chapters of this thesis have shown that fathers' criminal convictions influence the development of children's criminal careers. Children of fathers with many criminal convictions are at greater risk of developing persistent criminal careers than children with non- or marginally criminal fathers. Also, in the years following a paternal criminal conviction and in the years after a parental divorce children are more at risk of a conviction. In this chapter, we will investigate an additional aspect of the intergenerational transmission of convictions. Our focus will be on the influence of paternal imprisonment on the development of criminal careers of children.

There is increasing concern that imprisonment may have far-reaching undesirable consequences for prisoners, their families, and the wider community (Clear 2007; Hagan and Dinovitzer, 1999; Murray and Farrington, 2008a; Tonry and Petersilia, 1999; Travis and Waul, 2003). However, the effects of imprisonment on children of prisoners are still understudied. Previous research does show that children of prisoners are at increased risk for antisocial and delinquent behavior through the life-course (Murray and Farrington, 2005; Huebner and Gustafson, 2007; Murray, Janson, and Farrington, 2007).

Previous studies have not adequately tested the mechanisms that explain when and how paternal imprisonment influences children's criminal careers. Most studies have lacked large enough samples, or enough cases of paternal imprisonment, to investigate this issue. Without large samples, it has not been possible to compare, for instance, the effects of paternal imprisonment occurring in early childhood and the effects of paternal imprisonment occurring later in adolescence (but see Murray, Janson, and Farrington, 2007). Also, studies often are unable to adequately control for the criminal history of the parents.

In this chapter, we will use the data of the Criminal Career and Life course Study to investigate the influences of paternal imprisonment on the criminal convictions of children. We will focus on the long-term effects of paternal imprisonment and on the development of criminal careers of children.

In this chapter, we first estimate the effects of paternal imprisonment while controlling for fathers' criminal career trajectories as well as other risk factors known to influence children's criminal behavior. The first research question of this chapter thus reads: *What is the long term effect of paternal imprisonment on the development of criminal behavior of children?*

Second, we will explicitly investigate whether the effects of paternal imprisonment on children differ according to the timing and the duration of the imprisonment. The second question therefore is: *To what extent do a) the timing and b) the duration of paternal imprisonment influence the development of criminal behavior of*

children? We will also analyze whether there are different effects for sons and daughters. We examine the development of criminal convictions of children between ages 18 to 30. Our focus will be on the adult criminal careers (ages 18 to 30) and not on complete criminal careers (as in the other chapters of this thesis) because this focus will provide more comparability with previous studies on paternal imprisonment.

6.2 Previous research

A critical problem for research focusing on the influence of paternal imprisonment is to separate out the effects of parental imprisonment on children from the influence of other childhood risk factors. Large-scale longitudinal studies show that children of prisoners are much more likely than their peers to be exposed to other risk factors, such as low IQ, high daring, poor school attainment, poor parenting practices, parental criminality, and low family socioeconomic status (Huebner and Gustafson 2007; Murray and Farrington 2005; Phillips, Erkanli, Keeler, Costello and Angold, 2006). It is particularly important to disentangle the effects of parental imprisonment from the effects of parental criminality, because prisoners tend to be highly criminal, and the results of our previous chapters show that there is strong evidence that crime runs in the family.

To accurately estimate the long-term risks for children after parental imprisonment, and the effects on children's criminal careers, studies need to use representative samples, suitable control groups, and long-term follow ups. Four main studies have done this to date (for an extensive review of prior research see Murray and Farrington, 2008a).

In the first study, Huebner and Gustafson (2007) compared rates of adult offending behavior between thirty-one children whose mothers had been imprisoned and 1,666 children whose mothers had not been imprisoned, in the National Longitudinal Survey of Youth (NLSY). The NLSY is a prospective longitudinal survey of males and females in the United States, who were aged 14 to 22 in 1979 (Center for Human Resource Research 2006). Of children with imprisoned mothers, 26% were convicted as an adult, compared with 10% of controls. Controlling for background variables (including child, maternal, paternal, family, and peer risk factors), maternal imprisonment still significantly predicted adult convictions. These results are consistent with the idea that maternal imprisonment has a causal effect on children.

In the second study, Murray and Farrington (2005) investigated the effects of parental imprisonment on children in the Cambridge Study in Delinquent Development (CSDD). The CSDD is a prospective longitudinal study of 411 boys, born in 1953 and living in a working-class area of South London (Farrington, 2003). Outcomes were compared

between 23 boys who were separated from their parents because of parental imprisonment (between birth and age ten), and four control groups: i. boys with no history of parental imprisonment or parent-child separation (up to age ten), ii. boys separated because of hospitalization or death, iii. boys separated for other reasons, and iv. boys whose parents were imprisoned only before the boy's birth. Parental imprisonment during childhood was a strong predictor of antisocial-delinquent behavior through the life-course. For example, of boys separated because of parental imprisonment, 65% were convicted themselves between ages 19 and 32, compared with 21% of boys with no history of parental imprisonment or separation. Effects of parental imprisonment remained even after controlling for other childhood risk factors in the study (including parental criminality), suggesting that parental imprisonment might have a causal effect on children. Parental imprisonment also strongly predicted boys' mental health problems, educational failure, drug use, and unemployment in the CSDD (Murray and Farrington 2008a; Murray and Farrington, 2008b).

In the third study, Murray, Janson and Farrington (2007) compared rates of adult offending behavior of 283 children whose parents were imprisoned (from the children's births until they were age 19) and 14,589 children without imprisoned parents, in Project Metropolitan. Project Metropolitan is a prospective longitudinal survey of children born in 1953, and living in Stockholm, Sweden (Janson, 2000). Parental imprisonment was strongly predictive of offspring criminal behavior between ages 19 and 30. Of prisoners' children, 25% offended as adults, compared with 12% of controls. However, when account was taken of background criminality of parents (by using regression analyses, and comparing children exposed to parental imprisonment in childhood with children whose parents were imprisoned only before the child's birth), there were no additional effects of parental imprisonment on children. This suggested that parental imprisonment did not cause offspring offending in Sweden.

In the fourth study, Kinner, Alati, Najman and Williams (2007) compared 137 children whose mothers' partners had ever been imprisoned with 2,262 children whose mothers' partners had not been imprisoned, in the Mater University Study of Pregnancy. This is a prospective longitudinal survey of 8,458 women who were pregnant in Australia in 1981, and their children (Najman, Bor, O'Callaghan, Williams, Aird, and Shuttlewood 2005). At age 14, children whose mothers' partners had been imprisoned were significantly more likely to have externalizing problems than their peers. However, after controlling for other parental and family risk factors, there was no effect of the imprisonment on child externalizing problems, suggesting that the original association was spurious.

In summary, four longitudinal studies show that parental imprisonment is strongly associated with child antisocial and criminal behavior. However, the evidence on

causal effects is mixed: two studies suggest that there are causal effects, and two studies suggest that the relationship is spurious. It is possible that these differences are accounted for by differences in the social and penal contexts where the studies took place (Murray, Janson, and Farrington, 2007).

Effects of timing and duration of parental imprisonment

In this chapter, we will explicitly investigate the influence of the timing and the duration of paternal imprisonment on children. These questions have been investigated to some extent in prior research. In Project Metropolitan, there was little difference in the criminal outcomes of children according to whether parental imprisonment occurred from birth to 6 years or from 7 to 19 years (Murray, Janson, and Farrington, 2007). Also, the more times parents were imprisoned, the more likely children themselves were convicted as adults (Murray, Janson, and Farrington, 2007). In the Cambridge Study, boys whose parents were imprisoned for longer than two months were more likely to be convicted as adults than boys whose parents were imprisoned for less than two months (Murray, Janson, and Farrington, 2007). However, these results could be attributable to a selection effect if parents imprisoned more frequently or for longer periods were more antisocial than other imprisoned parents.

To investigate the influence of a) timing and b) duration of paternal imprisonment more extensively, studies need to use a very large sample including many children of prisoners. This makes it possible to divide participants into more than one category according to timing/duration of parental imprisonment, control for parental criminality, and retain statistical power. In the analyses in this chapter, there will be enough imprisoned fathers to account for timing and duration-differences while controlling for the criminal history of fathers. Because of the unique character of the CCLS data, we are able to study long-term effects on children's criminal convictions. While previous research on children of prisoners mainly examined dichotomous outcomes of child problem behavior (problematic versus non-problematic), we investigate the development of criminal convictions in a continuous form, from ages 18 through 30.

Research Setting: The Netherlands

We investigate the effects of imprisonment on children in the Netherlands. In the 1970s, the Netherlands had an extremely mild penal climate, with the lowest rate of prisoners world-wide (Downes and Van Swaaningen, 2007; Franke, 2007). Postwar developments in the Dutch Penal system resulted in the most humane penal system in Europe.

Rehabilitation was the leading principle of the prison sentence (Boone, 2007). From approximately 1985, the trend reversed and the number of prisoners in the Netherlands rose rapidly. Currently, the rate of imprisonment in the Netherlands (128 per 100,000 of national population) is still smaller than in the United Kingdom (148), but larger than in Sweden (82) (Walmsey, 2007).

In the Netherlands, sanctions range from fines and community service to imprisonment. Determinate custodial sentences vary between one day and 20 years. Sentence lengths depend on the severity of the offence, whether the offender is a recidivist, and other circumstances. The quality of life in Dutch prisons is very high, compared with prisons elsewhere. For instance, prisoners serving long sentences may be granted unsupervised visits (Tonry and Bijleveld, 2007). In the CCLS sample, most children are born around 1970. Their fathers were imprisoned during the 1970's, 1980's and the beginning of the 1990's, when the Dutch penal system was still tolerant, mild and focused on rehabilitation. In 1990, the rate of imprisonment (with 45 per 100,000) was still very low (Downes and Van Swaaningen, 2007).

The low incarceration rate might affect the generalizability of this study. Because imprisonment was infrequent, fathers who went to prison were relatively prolific and serious offenders compared to in other countries. Therefore, our results might not be generalizable to countries with relatively high imprisonment rates, like the US, and perhaps not to contemporary Dutch society. Although we aim to account for the frequent offending of imprisoned fathers by including fathers' criminal histories as control variables in our models (e.g. the total number of criminal acts of fathers and their criminal trajectories), remaining unobserved variation might mean that the effects of paternal imprisonment on children are somewhat overestimated. We elaborate the implications of this issue in the discussion.

6.3 Theories

In this chapter, we will not use the dichotomy between static and dynamic theories in order to deduct hypotheses as we did in chapters 3, 4 and 5. In the current chapter, we will use insights from theories designed to explain the influences of parental imprisonment. Murray and Farrington (2008a) distinguish four theories that explain how paternal imprisonment might cause an increase in child criminal behavior, which we discuss below (see also Hagan and Dinovitzer, 1999).

First, trauma-theories suggest that the parent-child separation caused by the imprisonment might be harmful for children (for a full discussion of this perspective see Murray and Murray, in press). Attachment theory (Bowlby, 1969) and social bonding

theory (Hirschi, 1969) both acknowledge the importance of children's attachment to their parents. The separation caused by imprisonment usually is unexpected and opportunities for contact are often very restricted during their imprisonment. Following trauma theories, disrupted attachment to the father following paternal imprisonment might cause an increase in children's delinquent behavior. Paternal imprisonment might have stronger effects on children if it is experienced early in childhood, because parent-child bonding in early childhood is particularly important for child development, and separation can be more disruptive when young children have fewer cognitive skills to process the event (Kobak 1999; Murray and Farrington 2008a). Longer separations might predict worse outcomes for children.

Second, modeling and social learning theories (e.g., Matsueda, 1988; Sutherland, Cressey and Luckenbill, 1992) suggest that parental imprisonment might cause an increase in child criminal behavior because children become more aware of paternal criminality and imitate their fathers' behavior. Differential association theory (Sutherland, et al., 1992) proposes that criminal behavior is learned in the same way as normal (accepted) behavior is learned. Thus, learning of criminal behavior primarily takes place in intimate personal groups, such as the family. Not only are the techniques to commit crime learned, but motives, values and attitudes towards crime are also learned (Sutherland, et al, 1992; Akers and Jensen, 2003). Association with a criminal father might be especially influential in determining children's criminal behavior. Paternal imprisonment could make children more aware of their parent's criminality and encourage the idea that committing crimes is normal and desirable. Such learning and imitation processes might be especially strong after early childhood, during adolescence, when children are more aware of the meaning of their fathers behavior and imprisonment. At the same time, removal of a highly antisocial parent from the household, because of imprisonment, might mitigate these learning processes and, in some cases, actually reduce the probability that children develop criminal behavior.

Third, strain theories suggest that the loss of economic and social capital due to paternal imprisonment causes children to commit more crimes (Arditti, Lambert-Shute, and Joest 2003; Ferraro, Johnson, Jorgensen, and Bolton, 1983). Parents cannot contribute to family-income while in prison and telephone calls and prison visits can add considerably to family expenses (McLanahan and Sandefur, 1994). In the long-term, imprisonment might lead to unemployment and fewer labor market opportunities for ex-prisoners. Also, children are more likely to have unstable care arrangements when one of their parents is in prison. Therefore, the quality of parental care and supervision may be reduced by paternal imprisonment. Because of reduced income, social capital and supervision, children with imprisoned parents may have fewer chances in school and in

the labor market. This may increase their risk for delinquency compared to children of non-imprisoned parents.

Finally, labeling theories suggest that paternal imprisonment might cause children to experience stigma, bullying and teasing which increases their criminal behavior (Boswell and Wedge 2002; Braman 2004). Children might become more reluctant to go to school and to socialize with other children. As a result, children with imprisoned parents might perform worse at school and in the labor market than their peers. There might also be official bias against children of prisoners, making them more likely than other children to be monitored by the police and to be convicted. Labeling-mechanisms will be most likely to influence children when parental imprisonment endures for a long period of time and when it is experienced in adolescence. When children are somewhat older, they understand the meaning of paternal imprisonment better. In these settings, stigmatization and bullying will be more powerful.

Hypotheses about the effects of timing and duration of parental imprisonment on children

We are unable to directly test the theories described above on why paternal imprisonment causes an increase in children's criminal behavior. To test these theories directly, detailed and carefully sequenced data on paternal imprisonment, the hypothesized mechanisms, and outcomes would be necessary. Instead, we aim to test the validity of the theories indirectly: we test hypotheses about the timing and duration of paternal imprisonment as they relate to the theories described above.

The first hypothesis derived from trauma theories reads: H1: *Paternal imprisonment in early childhood leads to a higher chance of criminal behavior in adulthood, than paternal imprisonment in other phases over the life course* (first timing-hypothesis).

The second hypothesis derived from learning theories, is: H2: *Paternal imprisonment in adolescence leads to a higher chance of criminal behavior in adulthood, than paternal imprisonment in other phases over the life course* (second timing-hypothesis).

Trauma-theories, strain theories and labeling theories all assume that the influence of paternal imprisonment will be greater if the imprisonment endures for a longer period of time. Therefore, our third hypothesis is: H3: *Paternal imprisonment for longer periods increases the risk for criminal behavior in adulthood more than parental imprisonment for shorter periods (*first duration-hypothesis).

Learning-theories suggest a different, more complex, duration hypothesis. Because the imprisonment of fathers increases children's awareness of paternal criminality, children (initially) might be put more at risk of future offending by parental imprisonment. However, longer durations of paternal imprisonment might actually

reduce children's chances of offending. This is because, while fathers are in prison, children cannot learn from the (criminal) actions of fathers. Previous research shows that effects of paternal antisocial behavior on child conduct problems are higher in periods when children actually live with their father (Jaffee, Moffit, Caspi and Taylor, 2003). Thus our final hypothesis, derived from learning theories reads: H4: *Paternal imprisonment for short periods increases the risk for criminal behavior, but paternal imprisonment for longer periods decreases the risk for criminal behavior* (second duration-hypothesis).

6.4 Methodology

In this chapter, we investigate the influence of paternal imprisonment. Since the focus in this chapter is on the criminal behavior of children who already reached adulthood, we selected all children aged above 18.[13] This results in a total of 5,981 children for the study. Table 6.1 shows some descriptive statistics about the fathers and the children in this chapter.

Table 6.1: Characteristics of the CCLS men and their children

	CCLS men
CCLS men	
Number of men	4271
Number of men with children > 18 year	2667
Number of men ever in jail	1194
Mean number of convictions	10.7
Children	
Number of children above the age of 18	5981
Number of boys	3013
Number of girls	2968
Number of convicted children	1508
Mean age	33.5
Mean number of convictions from age 18 until age 30	1.3

Imprisonment of fathers

Using extracts from the General Documentation Registry of the Ministry of Justice Court Documentation Service, a complete list of the criminal convictions and all sentences imposed (including incarceration) of the 2667 fathers and their 5,981 children was compiled. When examining the impact of imprisonment of fathers and the timing of the

[13] Our choice to focus on the criminal behavior of children who have reached adulthood is mainly driven by our aim to establish precedence of the possible cause (paternal imprisonment in childhood) before possible consequences (criminal behavior of children).

imprisonment, we differentiate between three age-categories in which a father could have been imprisoned (1) before the birth of the child, (2) between the birth of a child and the child's 12th birthday, and (3) between the 12th and the 18th birthday of the child.[14] Of course, fathers could also be imprisoned in more than one age-category (or in none of the categories). We therefore distinguish between eight different combinations. All combinations are shown in Table 6.2. The first group (59%) consists of children whose fathers were convicted, but were never imprisoned (the reference group for most of the analyses). The second group contains children whose fathers were imprisoned only between their birth and their 12th birthday (11 %). The third group (5%) consists of children whose fathers were imprisoned between their 12th and 18th birthday, and the fourth group (6%) of children had fathers who were imprisoned both between their birth and their 12th birthday as well as between their 12th and 18th birthdays. The fifth group (9%) contains children whose fathers were imprisoned only before the child was born. The sixth group (5%) consists of children whose fathers were imprisoned before their birth and between their birth and their 12th birthday. A very small group (1%) contains children whose fathers were imprisoned before they were born and after their 12th birthday, and a final group (4%) consists of children whose father was imprisoned during all three time periods.

As well as investigating the influence of the timing of imprisonment, we investigate whether there is a dose-response relationship between the length of paternal imprisonment and the chances of a child being convicted. We counted the days fathers were in prison between the birth of their child and the child's 18th birthday. We distinguished between five groups according to the amount of time fathers spent in prison, from zero days to over one year[15] (see Table 6.2 for details).

Fathers' conviction patterns

To investigate the effects of paternal imprisonment on children, we took into account the effects of father's criminal activities on their children. We accounted for the criminal history of fathers in two ways. First, we accounted for the number of convictions -and thus for the chance of imprisonment- of fathers. The mean number of convictions fathers had before the birth of their children is 2.1; the mean number of convictions between the

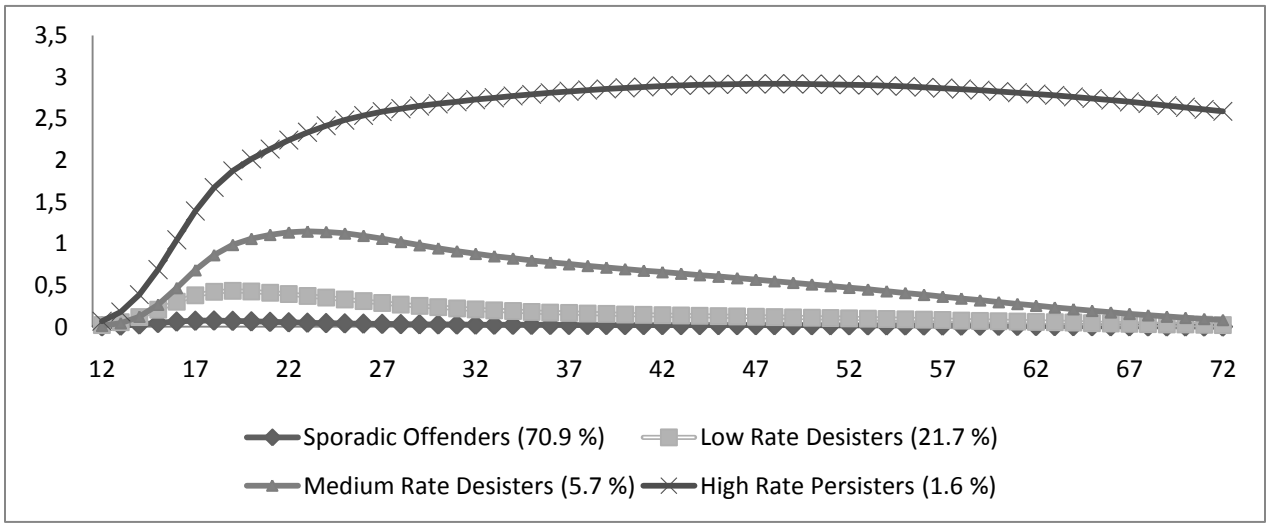
[14] We are aware that some authors have created different timing-groups than we did. Murray, Janson and Farrington (2007) looked at differences between paternal imprisonment between ages 0-7 and 8-12. We decided to limit our timing-categories to three, because we also take multiple imprisonments into account. Also, our theoretical expectations are about childhood and about adolescence. The categories we created are most appropriate to test our hypotheses.

[15] We chose a categorical measure instead of a linear measure, because the days fathers spent in prison had a much skewed distribution. The cut-offs were decided on the basis of the cumulative frequencies.

birth of the child and the child's 12th birthday is 1.6, and the mean number of convictions of fathers between the child's 12th birthday and their 18th birthday is 0.6.

To more fully account for unobserved heterogeneity between fathers, we also use a second measurement: the shapes of fathers' longitudinal conviction trajectories over their life course. In order to identify groups of offenders following conviction trajectories that are distinct in terms of time path, we used latent class growth curve analysis (LCGC) (Nagin and Land 1993; Nagin 1999, 2005). The four trajectories are graphically presented in Figure 6.1 (note: these are the same groups as in chapter 3). A large group of offenders (70.9%) hardly had any convictions apart from their conviction in the sampling year. We label these offenders Sporadic Offenders (SO). Two groups, labeled Low Rate Desisters (LR-D) and Moderate Rate Desisters (MR-D) respectively, show a rise and decline in offending that reflects the well-known age-crime curve. Note that while declining, the average conviction rate for 50-year-old offenders on the MR-D-trajectory is still 0.5 per year. Finally, a small group (1.6%) of offenders, labeled High Rate Persisters (HR-P), continues to show high rates of offending far into adulthood.

Figure 6.1: Trajectories of the CCLS-fathers



By age 72, the average HR-P has been convicted approximately 130 times. Based both on the level and chronicity of their offending, this latter group can be said to best fit the description of the life course persistent offender indicated in Moffitt's taxonomy (Moffitt, 1993). We used both the number of convictions of fathers and the trajectory group membership as control-variables for estimating the effects of paternal imprisonment on children.

Although trajectory group membership includes criminal offences committed by fathers after the 18th birthday of a child, we decided to use these trajectory groups to

capture the pre-existing propensity of fathers. We assume that this propensity remains more or less stable during the life course. These trajectory groups not only differentiate criminal behavior between fathers, but also might differentiate, for instance, childrearing abilities between fathers. This will provide us with the most extensive possible control variable available in the data set. We will probably underestimate our imprisonment-effect by controlling for trajectory-groups because they include information from after parental imprisonment occurred, but we chose to do so because we wanted to control for father's criminal history as much as possible. We ran additional analyses (only controlling for the number of convictions of fathers up until children were aged 18) in order to examine such possible underestimation (see appendix 3). The two measurements (trajectories and number of convictions) do not show any multi-collinearity problems.

Other control variables

We also control for several family characteristics which are known to affect the criminal convictions of children. We control for whether parents are divorced (0/1), for the number of children in a household, whether the father was born abroad (0/1), whether the father was a known drug or alcohol-abuser (0/1) and whether the mother had the child when she was a teenager (0/1). As some of these controls could also be caused by paternal imprisonment, for instance parental divorce, controlling for these variables could lead to an underestimation of effects of paternal imprisonment on children. Hence, our tests of paternal imprisonment effects are conservative.

Previous research has shown that the relation of age with criminal behavior is curvi-linear (Gottfredson and Hirschi, 1990; Blokland, 2005). The well-known age-crime curve shows a sharp rise in the teens and early twenties, followed by a decline afterwards. We control for the age-crime curve by using two (log) age variables; the first one indicates the decline after the peak, the second variable the initial rise. If both effects are equally large, the curve is symmetric around the middle (Blossfeld & Huinink, 1991).

We chose this type of modeling (and not the more traditional type of modeling with a squared age term) because the age-crime curve is not always symmetric (usually, the initial rise is much steeper than the decline after the peak). Table 6.2 shows all the descriptive statistics of all the variables used in analyses.

Table 6.2: Descriptive Statistics (CCLS children)

			Mean/Proportion	Range	N
Time constant variables					
Personal Characteristics					
Female			.50	0/1	5981
Timing of fathers' imprisonment in relation to child age					
Before birth	0-12	12-18			
No	No	no (ref)	.59	0/1	5981
No	Yes	No	.11	0/1	5981
No	No	Yes	.05	0/1	5981
No	Yes	Yes	.06	0/1	5981
Yes	No	No	.09	0/1	5981
Yes	Yes	No	.05	0/1	5981
Yes	No	Yes	.01	0/1	5981
Yes	Yes	Yes	.04	0/1	5981
Total number of offences of father					
Before child's birth			2.01	0-17	5981
Child 0-12			1.64	0-12	5981
Child 12-18			.60	0-6	5981
Criminal Trajectory Group Father					
SO (ref)			.59	0/1	5981
LR-D			.29	0/1	5981
MR-D			.09	0/1	5981
HR-P			.02	0/1	5981
Family Characteristics before age 18					
Parents separated (yes=1)			.56	0/1	5981
Number of siblings			3.31	1-11	5981
Father born abroad (yes=1)			.12	0/1	5981
Alcohol abuse father (yes=1)			.24	0/1	5981
Drug abuse father (yes=1)			.01	0/1	5981
Teen pregnancy mother (yes=1)			.11	0/1	5981
Total length imprisonment father before age 18					
0 days (ref)			.68	0/1	5981
1-30 days			.09	0/1	5981
30-180 days			.08	0/1	5981
180-360 days			.03	0/1	5981
More than 360 days			.11	0/1	5981
Time variant variables					
Age			23.36	18-30	60,626
Conviction in a certain year (dependent variable)			.06	0/1	60,626

6.5 Results

In order to investigate the effects of paternal imprisonment on the development of criminal convictions of children, we use multilevel logistic regression analysis evaluating the odds of a conviction in a given year (between ages 18 and 30). We created a person-year file (starting at age 18, ending at age 30). The file consists of 5,981 children and 60,626 person-years. For every year, it is recorded whether or not each child was convicted. We used multilevel logistic regression models to calculate the chance of conviction per year. This procedure adjusts for the nested structure of the data. Children are nested within fathers, and years are nested within children. Table 6.3 shows the results of the analyses.

Model 1 shows the effects of child sex and age and the eight imprisonment timing-variables on the chances of children's criminal behavior (see Table 6.3). The negative parameter for females indicates that daughters have fewer convictions than sons. The predictor of the decline in convictions after the peak age (log(30-age)) is larger than the predictor for the initial rise (log(age-18)). Both parameters are small, indicating a very flat age-crime curve, peaking in the early twenties somewhat before the middle of the period at risk ((30+18)/2=24).

Model 1 shows large differences in the chances of conviction for children of imprisoned fathers depending on the timing of paternal imprisonment. Children whose fathers were imprisoned between their birth and the 12th birthday show higher chances of conviction than children whose fathers never went to prison. Children whose fathers were imprisoned only before their birth are at greater risk of conviction than children whose fathers never went to prison. However, this increase in risk is much smaller than the increase in risk associated with paternal imprisonment during childhood (0-12 years).

Having a father imprisoned before birth increases the odds of a conviction by 1.4 while having a father in prison between ages 0-12 increases the odds of conviction by 1.97 (both compared to having a father who was never imprisoned). The timing of paternal imprisonment is clearly important for the chances of a criminal conviction.

The chance of conviction for children whose fathers were imprisoned in early childhood (before age 12) is slightly higher than for children whose fathers were imprisoned later. This is in line with our first timing-hypothesis (H1) and the trauma theories. In additional analyses (see appendix 3; Table 6.3c), we calculated interactions between "child sex" and the timing-variables. The results show positive but non-significant differences between boys and girls in the influence of the timing of imprisonment of fathers on children's criminal convictions. Thus, there are no significant differences in the influence of timing of paternal imprisonment between sons and daughters.

After we added control variables in Model 2, we see that all except one of the results for the imprisonment timing-variables become non-significant.[16] Children whose fathers were imprisoned between ages 0-12 remain at significantly increased risk of conviction compared to children whose father never went to prison. Children whose father was imprisoned between ages 0-12 thus have a significantly higher chance of a conviction, even after accounting for father's criminal history (and other family characteristics), compared to children whose fathers never went to prison. The odds of conviction for these children is about 1.2 times as large as for children whose fathers never went to prison, taking into account the other variables. Although significant, this is not a very large effect size. Nevertheless, having a father imprisoned between ages 0-12 is an independent risk-factor for children's own criminal behavior in adulthood. Again, these findings give support for our first timing-hypothesis (H1) and the trauma theories. Apparently, separation because of imprisonment in early childhood is the most damaging.

Model 2 also shows significant effects of the total number of convictions fathers committed and their group-membership (LR-D) on children's chances of committing crime in adulthood. Having fathers with a more extensive criminal record increases the chances of conviction, especially when these offences are committed after the birth of the child.

While having a father belonging to the Low-rate Desisters significantly increases the chance of conviction (compared to having a Sporadic Offender as a father) there is no significant effect of having a father belonging to the Moderate Rate Desisters and High-Rate Persisters. This could be explained by the small numbers of children with fathers in the MR-D and HR-P groups, or by the association of these groups with many convictions of the father (which are controlled for in the model). Finally, we see a significant increase in the chance of conviction for children whose parents are separated, whose fathers were born abroad and whose mothers were teenaged when their first children were born.

[16] We also ran models only controlling for the number of fathers' convictions. Results of these analyses showed that the effects of having a father imprisoned between ages 0-12 and having a father imprisoned before birth and between ages 0-12 were significant, compared to not having a father in prison (see appendix 3; Table 6.3b).

Table 6.3: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 5,981; $N_{person\text{-}years}$ = 60,626)

			Model 1				Model 2				Model 3				Model 4			
			B		Se	Exp (B)	B		Se	Exp (B)	B		Se	Exp (B)	B		se	Exp (B)
Constant			-2.89	**	.14		-3.34	**	.14		-2.83	**	.14		-3.36	**	.14	
Personal Characteristics																		
Sex (Female =1)			-2.11	**	.04	0.18	-1.71	**	.04	.18	-1.71	**	.04	.18	-1.77	**	.04	.17
log (age-18)			0.04	*	.04	1.09	.77	**	.04	1.08	.08	*	.04	1.09	.77	*	.04	1.08
log (30- age)			0.10	*	.04	1.17	.17	**	.04	1.18	.16	**	.04	1.17	.18	**	.04	1.18
Timing of fathers' imprisonment																		
Before birth	0-12	12-18																
No	No	no (ref)																
No	Yes	No	.67	**	.05	1.97	.21	**	.05	1.23								
No	No	Yes	.57	**	.05	1.77	.17		.08	1.19								
No	Yes	Yes	.90	*	.06	2.46	.14		.07	1.15								
Yes	No	No	.33	*	.07	1.40	-.06		.08	.94								
Yes	Yes	No	.89	**	.08	2.43	.17		.08	1.18								
Yes	No	Yes	.78	*	.22	2.20	.07		.04	1.07								
Yes	Yes	Yes	1.01	**	.07	2.77	.12		.09	1.13								
Total length father's imprisonment																		
0 days (ref)																		
1-30 days											.61	**	.05	1.84	.31	*	.05	1.36
30-180 days											.70	**	.06	2.01	.16		.09	1.17
180-360 days											.67	**	.08	1.95	.02		.06	1.02
More than 360 days											.88	**	.05	2.43	.11		.06	1.12

Table 6.3 (continued): Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 5,981; $N_{person\text{-}years}$ = 60,626)

	Model 1			Model 2			Model 3			Model 4		
	B	se	Exp (B)	B	Se	Exp (B)	B	Se	Exp (B)	B	se	Exp (B)
Total number of convictions												
At age child: before birth				.04 *	.01	1.04				.04 *	.01	1.04
At age child : 0-12				.06 *	.01	1.06				.07 *	.01	1.07
At age child: 12-18				.07	.04	1.07				.06 *	.02	1.07
Criminal trajectory group father												
SO (ref)												
LR-D				.29 **	.05	1.34				.29 **	.05	1.34
MR-D				.35	.24	1.42				.38	.19	1.47
HR-P				.01	.14	1.00				.03	.14	1.03
Family Characteristics before age 18												
Parental divorce (yes=1)				.33 **	.04	1.39				.34 **	.04	1.40
Number of children within the family				.03	.02	1.03				.02	.02	1.03
Father born abroad				.15 *	.05	1.22				.21 *	.05	1.23
Alcohol abuse father				-.02	.04	.93				-.08	.04	.92
Drug abuse father				.04	.14	1.04				.02	.14	1.02
Teen pregnancy mother				.27 *	.05	1.23				.22 *	.05	1.24
Intercept variance level 2	1.09 **	.06		.95 **	.03		1.07 **	.04		.94 **	.01	
Intercept variance level 3	2.75 **	.07		2.68 **	.03		2.68 **	.08		2.69 **	.08	

***** p <.05 ****** p <.01 *******p < .001

In Model 3, we investigate a dose-response relationship between the length of imprisonment of fathers and the probability of child conviction. We see that children who have a father in prison for a longer period of time have a higher chance of conviction. Paternal imprisonment for less than one month is associated with 1.8 times higher odds of child conviction compared to no paternal imprisonment. Paternal imprisonment for over 360 days is associated with 2.4 times higher odds of child conviction compared to no paternal imprisonment. This is a larger increase in odds than for other durations of paternal imprisonment (1-30 days, 30-180 days, 180-360 days). Thus, there is some support for the first duration-hypothesis (H3), which states that the longer a father is imprisoned, the higher is the probability that a child has a conviction. However, the odds of conviction between paternal imprisonment for 1-30 days, 30-180 days and 180-360 days hardly differ. Therefore, there is not a clear, linear dose-response relationship.

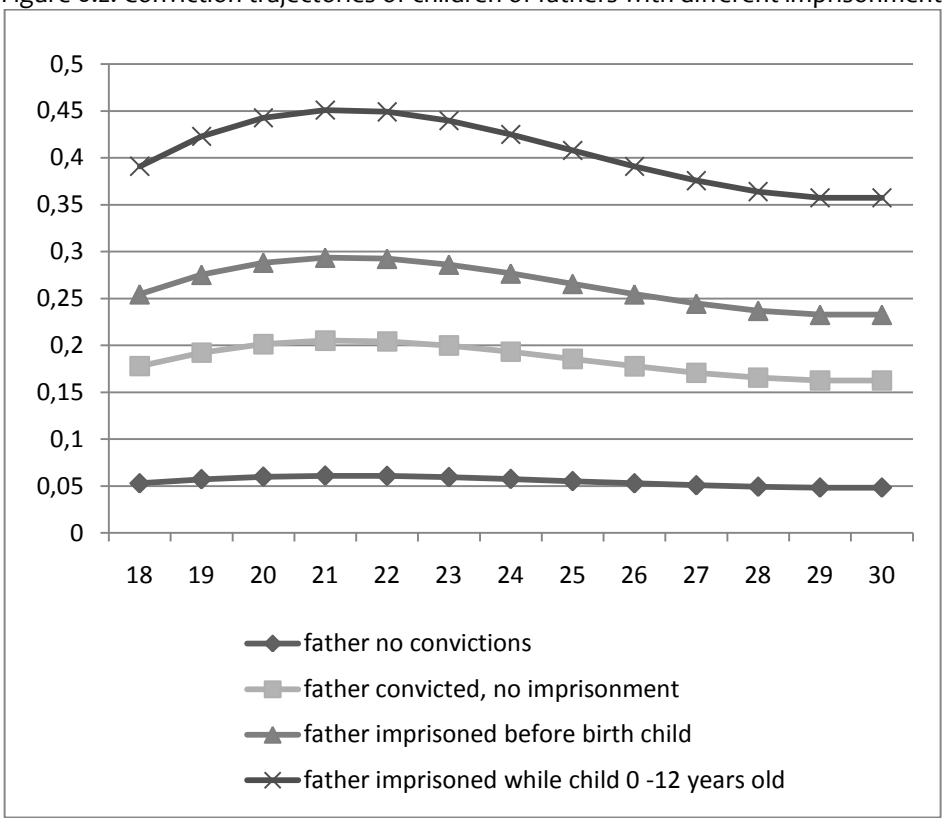
In Model 4, control variables are added to estimate the independent effects of duration of parental imprisonment on children's criminal behavior.[17] Only the difference between paternal imprisonment for 0-30 days and having no paternal imprisonment is significant. Paternal imprisonment for longer periods of time does not confer greater risk for child convictions than paternal imprisonment for 1-30 days. Therefore, after controlling for the father's criminal history and other family characteristics, there appears no increase in risk of child criminal behavior associated with longer periods of imprisonment. This finding disconfirms the first duration-hypothesis (h3), and lends some support to the second duration-hypothesis (H4), derived from learning theories. Children of imprisoned fathers have greater probabilities of convictions themselves, but only if their fathers are imprisoned for a short period of time. These results could also be explained by the relative scarcity of fathers imprisoned for long periods of time.

We also tested for interactions between child sex and the dose-response imprisonment variables (results in appendix 3; Table 6.3d). We found slightly larger significant influences for the dose-response variables for daughters than for sons. This finding clearly indicates that the influence of the duration of imprisonment is somewhat larger for daughters than for sons.

Next, we calculated whether the developmental patterns of children's criminal careers differed according to the timing-categories of paternal imprisonment (Figure 6.2). Developmental patterns of children's criminal careers (based on the parameters from Model 1 for the eight timing-categories of paternal imprisonment) are shown in Figure 6.2.

[17] We also ran de models only controlling for the number of fathers' convictions. Results of this analysis show that the effects of 0-30 days in prison and of more than 360 days in jail are significant (see appendix 3; Table 6.3b).

Figure 6.2: Conviction trajectories of children of fathers with different imprisonment-histories



Children in the last three timing categories (fathers imprisoned before birth and between 0-12, fathers imprisoned before birth and between 12-18, and fathers imprisoned in all three periods) are combined in one group in Figure 6.2, because the heights and shapes of these three groups are very similar. As Figure 6.2 shows, the trajectory patterns differ in height but not in shape. Thus, although there are differences in the probability of convictions between children of fathers with different imprisonment-histories, developmental patterns between ages 18 and 30 are alike for all children.

6.6 Conclusions

The aim of this chapter was to investigate whether imprisonment of fathers affects the development of criminal careers of their children in adulthood. The results of this chapter will contribute to answering our question to what extent intergenerational transmission of convictions exists. In the Netherlands, this is the first analysis of the influence of imprisonment of fathers on the criminal convictions of their children in adulthood. Also internationally, this is the first determination of the effects of timing and duration of

paternal imprisonment on the criminal convictions of children, while adequately controlling for paternal criminal history.

Results of this chapter show that paternal imprisonment during childhood does not alter the shape of the development of a criminal career. Paternal imprisonment does (to a small extent) alter the height of a criminal trajectory (i.e. the average number of convictions over their life course). Children whose fathers were imprisoned before they were aged 12 had a much higher chance of conviction from their 18th until their 30th birthday. When the numbers of fathers' criminal convictions were controlled for, the influence of parental imprisonment became much smaller, but remained significant. A very weak effect of paternal imprisonment on the development of criminal convictions of children remains. This is similar to the pattern of results to that found in a Swedish study (Murray, Janson, and Farrington 2007). Like in Sweden, the Netherlands have a history of an extended social welfare system and had (at least in the last century) a relatively mild penal climate with relatively low prison populations. These settings could explain the relatively weak effects of paternal imprisonment found on children's criminal careers, after accounting for parental criminality.

Although the Netherlands has had a particularly low imprisonment-rate, we stress that the prison population was unusually comprised of serious or violent persons compared to other countries. Thus, although we account for fathers' criminal histories as much as possible (by controlling for the total number of criminal convictions of fathers and their criminal history trajectories), we expect that the effects of paternal imprisonment may be somewhat overestimated in this study, because of this selection effect. It remains unclear whether similar, small effects would pertain in contemporary Dutch society or in other countries with a higher imprisonment rates, like the UK and the US.

With respect to the timing of fathers' imprisonment and the chances of children being convicted themselves, we found that having paternal imprisonment when children are young (until 12 years) has only a marginally greater effect on children's criminal careers than having a father imprisoned during adolescence. These results are similar to those of Murray, Janson and Farrington (2007) in which little differences were found in criminal outcomes between children whose fathers were imprisoned between 0 and 6 years old, and between 7 and 19 years old.

We found only partial support for the existence of a dose-response relationship between paternal imprisonment and child convictions. Having a father who is imprisoned for a longer period of time predicts a higher chance of a child having convictions in adulthood. This effect is larger for daughters than for sons. However, after controlling for fathers' criminal history, this effect becomes very small. Our dose-response findings might be interpreted using learning theories. They are consistent with the idea that

paternal imprisonment first leads to more awareness and imitation of criminal behavior among children, but that, if the imprisonment endures for a long period of time, children become protected from further learning and imitation of crime.

We found differences in the influence of paternal imprisonment on boys and girls. Although many more sons committed crimes than daughters, the influence of father's imprisonment appeared a little larger for girls than for boys. Like in Sweden, and contrary to expectations from some other research, effects of paternal imprisonment appear a little bit worse for daughters than for sons.

As already mentioned in the introduction, children's criminal convictions is not the only possible (undesirable) outcome of paternal imprisonment. Children could be influenced by paternal imprisonment in other domains of their lives as well. We suggest that future studies do not restrict themselves to examining children's criminal convictions, but that these also address possible effects of paternal imprisonment on other life domains. Future research should investigate children's school achievement, mental health, and success in the labor market (see Murray and Farrington, 2008, for a review of some studies in these areas). However, we hope that our study, and these first Dutch results, help to develop a more solid evidence base on which prison and social policies can be designed to protect children of prisoners from possible long-lasting undesirable outcomes.

Up until now, we have investigated different aspects of intergenerational transmission of convictions. We have analyzed the influence of the exact timing of paternal convictions and found that in the years following a paternal conviction children's chances to have convictions are higher. We have analyzed the influence of parental divorce and found that after parents get divorced, children have much higher chances to have convictions. In this chapter, we have analyzed the influence of paternal imprisonment and we have found that paternal imprisonment only to a very small extent influences the chances of children to have convictions. In the following and final empirical chapter, we will investigate two more aspects of the intergenerational transmission: convictions of mothers and convictions of siblings.

Chapter 7

The association of criminal convictions between family members: the effects of fathers, mothers and siblings

An earlier version of this chapter was published as: Van de Rakt, M., Nieuwbeerta, P. & Apel, R. (2009). The association of criminal convictions between family members: the effects of siblings, fathers and mothers. *Criminal Behaviour and Mental Health,* 19, 94-108.

7.1 Introduction

In the previous chapters of this thesis, we have already analyzed the influence of paternal criminal convictions on the development of the criminal careers of children. We established that in the years after fathers commit criminal acts chances for children to have convictions are higher. Also, we have seen that in the years following a parental divorce, chances for children to have convictions are higher. Finally, we have determined that paternal imprisonment has little effects on the development of the criminal careers of children. The aim of the current chapter is to investigate a possible cause for the association between criminal convictions of fathers and the convictions of their children. We will investigate whether and to what extent the maternal and sibling convictions explain the relation between criminal convictions of fathers and the convictions of their children.

The fact that we focus on the role of other family members as mothers and siblings is not surprisingly given the literature. The literature clearly shows that crime runs in the family. Farrington et al., (1996) for instance reveal that a very small proportion of families is responsible for a majority of all delinquent acts committed. Specifically, about 10 percent of families in the Cambridge Study in Delinquent Development (CSDD) generated 64 percent of all delinquent acts. Research using the Pittsburgh Youth Study also reveals a great deal of crime clustering within families (Farrington et al., 2001). These results indicated that the siblings in 12 percent of families were responsible for 59 percent of all of the delinquent acts committed by the sample. Other research demonstrates that criminal convictions of parents and children are highly correlated (Farrington, et al., 1996; Bijleveld & Wijkman, 2009; Thornberry et al., 2009). In short, having a family member with a criminal history—fathers, mothers and siblings alike—substantially increases the likelihood of committing delinquent acts.

Given the known central role of criminal family members, it is remarkable that so few studies have taken into account the criminal behavior of mothers and siblings. Most studies investigating associations of criminal behavior among family members focus on the criminal behavior of fathers and sons, instead of mothers and daughters. The emphasis on male family members is partly due to the fact that criminal behavior amongst men is more common than amongst women. There are a few studies in which the influence of both paternal convictions as well as the influence of maternal convictions is investigated (e.g. Thornberry, et al., 2003; Bijleveld & Wijkman, 2009; Farrington, et al., 1996). However, in most studies, the prevalence of female delinquency is very low. Larger samples –including paternal, maternal as well as sibling criminality- are needed to correctly establish the influences of all family members. A second drawback of

previous studies is that the techniques used to assess the influences in previous studies are not optimal.

Given the shortcomings of most earlier studies we aim to make progress by analyzing the effects of criminal behavior of various family members. Assessing the associations between criminal convictions of fathers, mothers, siblings and individuals in a correct manner will therefore be the first aim of this chapter. Furthermore, the second aim of this chapter is to analyze the influences of criminal convictions of family members on the development of complete criminal life courses of individuals. This will give us more insights into how the criminal behavior of one nuclear family member is related to the development of the criminal behavior of another member. In this chapter, we will research upon the following three questions:

1) *To what extent do criminal convictions of mothers relate to criminal convictions of children?*
2) *To what extent do criminal convictions of siblings relate to criminal convictions of a child?*
3) *To what extent do criminal convictions of a)mothers and b)siblings explain the relation between criminal convictions of fathers and the development of criminal careers of the children?*

In order to compare the influences of criminal convictions of mothers and siblings with the influences of convictions of fathers, we will establish the association between criminal convictions of fathers and children once again in this chapter.

7.2 Previous research

As we have seen in the previous chapters, there a few empirical studies which have investigated the intergenerational transmission of paternal convictions. This research demonstrates an association between the criminal acts of fathers and the subsequent delinquent behavior of their children (e.g. Rowe & Farrington, 1997; Smith and Farrington, 2004; Gorman-Smith et al., 1998). Most studies investigating intergenerational continuity in criminal behavior focus on the influence of paternal criminal acts on the criminal behavior of children. The emphasis is usually on the criminal behavior of fathers and of sons, instead of mothers and daughters. The emphasis on male parents is partly due to the fact that criminal behavior amongst men is much more common than amongst women.

There are a few studies in which the influence of both the paternal convictions as well as the influence of maternal convictions is investigated (e.g. Thornberry, et al., 2003; Bijleveld & Wijkman, 2009; Farrington, et al., 1996). Research using data from the

Pittsburgh Youth Study (Farrington, et al., 2001) and research with data of the Cambridge Study in Delinquent Development (Farrington et al., 1996) both conclude that the influence of fathers is somewhat more important than the influence of mothers. Besjes and Van Gaalen, investigating a very large sample of Dutch parents and children, conclude that mothers exercise the largest influence. Thornberry et al (2003) report on the Rochester Youth Development Study and found that a father's criminality exert a direct effect on the delinquency of his children, while for mothers this relation is mediated through parenting strategy. Findings of the Oregon Youth Study show that there are gender-specific pathways in the transmission of externalizing behavior. Fathers show larger influences on daughters than on sons (Kim, Capaldi, Pears, Kerr & Owen, 2009), while mothers externalizing behavior shows marginal influences on their sons. All in all, the results of these studies consistently show that paternal and maternal convictions both exert independent influences on the criminal behavior of children.

Unlike studies focusing on intergenerational transmission of crime which are limited in number, there have been many studies on the influence of the criminal behavior of brothers and sisters on individual criminal behavior. Most of these studies rely on self-report data and on relatively minor offences (e.g. shoplifting and drug abuse). Many of these studies also analyze the criminal behavior of siblings and friends simultaneously (Haynie and McHugh, 2003; Slomkowski et al., 2001). The existing research shows that the criminal behavior of siblings is strongly correlated (e.g. Fagan and Najman, 2003; Haynie and McHugh, 2003; Rowe and Gulley, 1992). Correlations are usually stronger among same-sex siblings (.45 to.50) than among opposite sex ones (.27) (Rowe and Farrington, 1997). Different explanations for the apparent sibling similarity in delinquency are often tested in the literature. For example, the quality of the bonds of siblings could be an explanation for their resemblance in delinquent behavior (Slomkowski et al., 2001). Additionally, peers that are mutually shared by siblings might account for a portion of the cross-sibling correlation in delinquency (Haynie and McHugh, 2003; Stormshak, et al., 2004).

Studies in which the influences of convictions of fathers, mothers and siblings are used to predict individual conviction rates are still very scarce. Farrington, Barnes and Lambert (1996) relate convictions of 411 males of the Cambridge Study in Delinquent Development to the convictions of their fathers, mothers and siblings. They neglect, however, to specify the relations controlled for the two other relations. Rowe and Farrington (1997) analyzed the criminal behavior of siblings relative to the criminal behavior of other family members and reported a sibling effect which is independent from parental criminal behavior. These studies were retrospective as they focused on children (only sons) and their parents. The Pittsburgh Youth Study with a similar retrospective design, reveals that fathers are the most important relative when it comes

to predicting the criminal behavior of their sons. In the study in this chapter, we aim to investigate to what extent the paternal intergenerational transmission of convictions is explained by convictions of mothers and siblings.

All in all, the research on relationships between the numbers of convictions of family members is growing but limited. As we have already established in the previous chapters of this thesis, the paucity of research inquiry into the associations of convictions of all family members has numerous causes. The most prominent cause is that the data requirements to investigate the relationship are daunting. First, one requires a longitudinal study providing information on the development of criminal behavior of parents as well as their children. Second, a prospective design is needed as such a design does not select upon the dependent variable (in this case, criminal behavior of the children). Convicted as well as non-convicted parents should be included in the design. Third, a very long period of observation is required in order to analyze both generations until adulthood (a time span of at least 50 years). Fourth, one needs data on the convictions of different siblings within a family. With our use of the CCLS data, we are able to meet all of these requirements.

7.3 Theories

There are several explanations for why convictions are so readily transmitted from parents to their children. In the introduction of this thesis we discussed the six different explanations for intergenerational resemblance as distinguished by Farrington et al. (2001). In the current chapter, we will use these mechanisms in order to derive hypotheses. All six mechanisms predict correlations of criminal convictions between all family members. The mechanisms, however, differ in their predictions of the extent to which maternal and sibling criminality can offer explanations for the relation between criminal convictions of fathers and children. We will discuss the six mechanisms once again and formulate predictions about the extent to which maternal and sibling criminality can offer an explanation for the relation between convictions of fathers and children.

The first explanation is that criminal behavior is only a small part of the transmitted behavior. A variety of undesirable behaviors, such as poverty, teenage pregnancy, and living in deprived neighborhoods are transmitted from one generation to another. Farrington et al., refer to this explanation as the "cycle of deprivation." According to this mechanism, the convictions of mothers and siblings will not offer an explanation for the relation between criminal convictions of fathers and the criminal careers of children. Convictions of all family members are outcomes of the cycle of deprivation.

The second explanation emphasizes the mechanism of "assortative mating." Men with a criminal history have a higher likelihood of marrying and procreating with women who also have a criminal history. These women will be less fit to raise children, putting their children at risk and increasing the chance that they themselves become involved in crime. This mechanism will be put to the test in this chapter. If the "assortative mating" explanation applies, convictions of mothers will explain (at least part of) the relation between paternal convictions and convictions of a child. We will see what will happen to the relation between convictions of fathers and children once we control for the criminal convictions of mothers.

The third explanation for intergenerational transmission is a process of imitation. Quite simply, children learn criminal behavior by observing and modeling the behavior of their parents. Brothers and sisters could learn attitudes and behaviors directly from each other as well. For example, younger siblings could learn norms, values and techniques (i.e. "definitions favorable to law violation") from their older brothers and sisters. Also, siblings may commit delinquent acts together or in one another's company (Warr, 1993). If learning or imitation is the causal mechanism underlying the intergenerational transmission of criminal behavior, then we would expect that (at least part of) the correlation between convictions of fathers and convictions of children will be explained when sibling convictions are taken into account. Children can learn the criminal behavior from their fathers and transmit their knowledge to younger siblings. In other words, children will learn from and imitate their parents, but because of relative closeness in age, they might more effectively learn from and imitate their siblings (possibly also via mutual friends).

The fourth explanation points to a genetic cause. Criminal parents may have some genetic predisposition for criminal behavior, a predisposition that is then transmitted from one generation to the next. If the causes of criminal behavior are genetic, then sibling resemblance in crime is attributable to the fact that the criminal biological relatives correlate. The criminal convictions of mothers will offer an explanation for the variation in criminal behavior of their children (as half of the genetic information comes from the mother), but not for the association between criminal convictions of fathers and the criminal careers of children. The criminal convictions of siblings cannot offer an explanation for this association either.

The fifth mechanism is environmental: Criminal parents tend to live and raise their children in the least favorable social environments, which increases the children's chances of criminal behavior. According to this mechanism, criminal convictions of all family members will correlate. If the mechanism is environmental, then the poor social and economic circumstances of the parents should largely account for the association in convictions between siblings. This would again result in little explanatory power of the

criminal convictions of siblings and the criminal convictions of mothers in the relation between convictions of fathers and children.

The sixth and final mechanism suggests that some families are monitored more intensively by law enforcement because of an official bias toward known criminal families. In other articles, a process of labeling is also suggested as a possible mechanism, whereby children born to criminal fathers have a higher chance of perceiving themselves as criminals, a "self-fulfilling prophecy" that results in the commission of crimes (Rowe and Farrington, 1997). According to this final mechanism, convictions of all family members will correlate, but convictions of siblings and mothers will not offer an explanation for the relation between criminal convictions of fathers and children.

Summarizing, all proposed mechanisms assume an association between the convictions of fathers, siblings and mothers. However, according to four mechanisms (cycle op deprivation, genetic cause, environmental cause and labeling/monitoring) convictions of siblings and mothers will not be able to account for (part of the) relation between criminal convictions of fathers and children. According to the assortative mating mechanism, convictions of mothers will explain part of the relation between criminal convictions of fathers and the criminal careers of children. Finally, according to learning and imitation-theories, the criminal convictions of older siblings should account for part of the relation between criminal convictions of fathers and the criminal careers of the children.

7.4 Methodology

In this chapter, we are interested in investigating the influence of mothers and siblings on the development of criminal convictions of children. The criminal records of all the partners of the original CCLS men and the matched control subjects were compiled (Van Schellen and Nieuwbeerta, 2007). As most fathers were at one point married to the mother(s) of their child(ren), we were able to link the criminal histories of mothers to the criminal histories of their offspring. Unfortunately, we did not have access to information about mothers who did not marry the father of their child(ren).[18] We were successful in locating information on 2,944 mothers (2,459 married to the original CCLS men, and 485 married to the matched control subjects). These mothers bore 5,831 children. Table 7.1 provides descriptive statistics on fathers and their children from the research and control groups.

[18] Children with mothers having valid data tend to be younger and to commit fewer offences, and their fathers commit fewer offences as well. These relationships are significant at p <.01. In light of this non-random selection, it is plausible that the empirical estimates provided herein are actually underestimates.

Table 7.1: Descriptive statistics (CCLS group and Control group)

	Total sample			Selection of focal children (with information on mothers)		
	Control group	CCLS group	Total	Control group	CCLS group	Total
Fathers						
Number of persons with children at least 12	485	3015	3500	458	2271	2729
Mean age in 2003	53.6	56.9	55.1	53.7	57	56.6
Mean number of convictions	0	10.3	8.4	0	10.1	8.4
Children						
Number of children at least 12	1066	6921	7987	955	4876	5831
Number of boys	562	3480	4056	499	2448	2947
Number of girls	504	3441	3962	456	2428	2884
Number of convicted children	119	1966	2086	104	1403	1507
Mean age in 2005	28.6	30.9	30.7	28.7	30.5	30.3
Mean number of convictions	0.3	1.8	1.6	0.2	1.7	1.5
Mothers/ Partners						
Number of persons				485	2459	2944
Mean age in 2003				52.6	52.6	52.6
Mean number of convictions				0.1	0.5	0.1

In the first panel of the table, we present descriptive statistics for the whole sample. In the second panel of the table, we present statistics about those children for whom we also have information about the mothers. In this chapter, we will only investigate those children for whom we have information about both the father as well as the mother.

In order to construct the total number of conviction of siblings, we have selected all siblings older than the focal child[19] (which is the child whose criminal behavior we will analyze) and calculated their mean number of convictions. We focus on older siblings only, because learning and imitation theories assume that learning takes place from older to younger siblings. Some children do not have older siblings.

In order to properly compare influences of convictions of fathers, mothers and siblings, one should use the same measurements. Previous research has generally compared different scaling of for instance paternal and maternal convictions (e.g. Besjes & Van Gaalen, 2009) making it difficult to compare. In the present study, we investigate the influence of criminal convictions of fathers, mothers and siblings while using comparable measurements of convictions. We have divided the total number of convictions in 4 categories (0 convictions, 1 conviction, 2-5 conviction and more than 5 convictions).

We will first investigate the relation between convictions of fathers, mothers, siblings and individuals using cross-tabulations and by calculating correlations between the numbers of convictions. After that, we will study to what extent the criminal convictions of mothers and siblings explain the relation between criminal convictions of fathers and the development of criminal careers of the children. We will do so, by using hierarchical logistic regression models estimating the chance for an individual to have one or more convictions in a year.

7.5 Results

Descriptive results

In Table 7.2, the relationship between the convictions of fathers and the convictions of their offspring is shown.[20] The children of non-convicted fathers (Control group) have the lowest likelihood of conviction; only 11.2 percent of these children are convicted. Daughters of non-convicted fathers have far lower conviction probabilities than sons—3.5 percent compared to 17.6 percent. Among children of fathers with one or more

[19] All children above the age of 12 (N=5,831) are research subjects. In this chapter, some of these children also appear as siblings in the analyses (when they are an older sibling of another child). In order to overcome confusion, we sometimes refer to children as focal children.

[20] The relations shown in Tables 7.2,7.3 and 7.4 are all tested for significance with chi-square tests, and are found to be significant at $p < 0.01$.

convictions (CCLS group), the likelihood of at least one conviction is a minimum 20.0 percent (children whose fathers acquire only one conviction).

Conviction risk increases steadily when the father is convicted for more criminal acts. Daughters appear to have fewer convictions than sons. Nevertheless, the influence of the father on the chance of a child's conviction is the same for sons and daughters: As fathers accumulate a more extensive criminal record, conviction risk for both sons and daughters rises. Of course, this relation has been well established in the previous chapters.

Table 7.3 provides the relation between the criminal history of mothers and the convictions of their children. Mothers commit fewer offences than fathers (compare the column marginals in Tables 7.2 and 7.3).[21] Two-thirds (67.8% and 64.3%) of the sons who have a mother with two to five or with more than five convictions were themselves convicted. For daughters, the respective figures are 29.6 and 26.7 percent. As with fathers, while daughters have fewer convictions than sons overall, the influence of the mother on the chance of a conviction is similar.

Table 7.4 shows the relationship between the number of convictions of siblings. The rows in this table represent the number of convictions of the focal child whereas the columns represent the mean number of convictions of the remaining older siblings (i.e. all non-focal children older than the focal child of the same father). Note that in this table, children without older siblings are omitted. As the siblings in the family accumulate more convictions, focal children have a far higher chance of being convicted of a crime as well. As with the data on fathers, daughters have fewer convictions than sons. The relationship is especially strong for boys—among boys whose siblings commit (on average) more than 5 criminal acts, about three-fourth (76,8%) are convicted at least once. For girls, the corresponding figure is one-third (36.7%).

[21] As this sample excludes unmarried mothers but includes unmarried fathers, these results may be biased.

Table 7.2: Relation between mean number of convictions of fathers and the number of convictions of children

	Convictions of fathers				
	0	1	2-5	More than 5.0	Total
Children					
0 convictions	88.8	80.0	74.8	65.6	73.9
1 conviction	6.5	7.5	8.8	10.4	8.9
2-5 convictions	3.8	8.4	10.1	12.7	10.0
more than 5 convictions	.8	4.1	6.3	11.3	7.2
N	1066	1460	2233	3233	5831
Boys					
0 convictions	82.4	68.6	62.4	49.2	61.7
1 conviction	9.8	11.6	12.3	11.9	11.6
2-5 convictions	6.2	13.7	15.3	19.0	14.9
more than 5 convictions	1.6	6.1	10.1	19.9	11.8
N	499	475	833	1140	2947
Girls					
0 convictions	96.5	95.0	88.0	79.2	86.9
1 conviction	2.6	3.2	6.6	10.2	6.9
2-5 convictions	.9	1.4	4.6	7.6	4.7
more than 5 convictions	.0	.5	.8	2.9	1.5
N	456	439	833	1156	2884

Table 7.3: Relation between number of convictions of mothers and number of convictions of children

	Convictions of mothers				
	0	1	2 -5	More than 5	Total
Children					
0 convictions	77.0	60.4	50.2	47.1	74.2
1 conviction	8.8	13.6	12.2	12.6	9.3
2-5 convictions	8.7	15.5	21.6	15.1	9.9
more than 5 convictions	5.5	10.5	16.0	25.2	6.7
N	5102	323	287	119	5831
Boys					
0 convictions	65.3	41.2	32.2	35.7	61.7
1 conviction	11.5	14.9	11.8	8.6	11.6
2-5 convictions	13.7	21.6	27.6	17.1	14.9
more than 5 convictions	9.5	22.3	28.3	38.6	11.8
N	2577	148	152	70	2947
Girls					
0 convictions	88.9	76.6	70.4	63.3	86.9
1 conviction	6.0	12.6	12.6	18.4	6.9
2-5 convictions	3.6	10.3	14.8	12.2	4.7
more than 5 convictions	1.4	0.6	2.2	6.1	1.5
N	2525	175	135	49	2884

Table 7.4: Relation between mean number of convictions of older siblings and the number of convictions of children

	Mean number of convictions of older siblings					
	No older sibling	0	0.1- 1.0	1.1-5.0	More than 5.0	Total
Children						
0 convictions	73.9	83.4	66.3	58.4	42.9	74.1
1 conviction	9.8	6.9	11.2	13.9	11.8	9.3
2-5 convictions	9.9	6.3	13.5	15.5	20.9	9.9
more than 5 convictions	6.4	3.4	6.9	12.3	24.4	6.7
N	2533	2092	480	440	287	5831
Boys						
0 convictions	61.5	73.9	51.4	40.8	23.2	61.7
1 conviction	11.3	10.0	15.1	17.5	10.9	11.6
2-5 convictions	16.1	9.8	20.7	19.7	24.6	14.9
more than 5 convictions	11.1	6.4	12.7	22.0	41.3	11.8
N	1290	1045	251	223	138	2947
Girls						
0 convictions	86.8	92.8	86.9	76.5	61.1	86.9
1 conviction	8.2	3.8	7.0	10.1	12.8	6.9
2-5 convictions	3.5	2.9	5.7	11.1	17.4	4.7
more than 5 convictions	1.5	.5	.4	2.3	8.7	1.5
N	1242	1047	229	217	149	2884

In Table 7.5 we have summarized the associations between convictions of all family members by calculating Spearman correlation coefficients for the total number of convictions. All of the correlations presented are significant at $p < 0.01$. There are especially high correlations between the convictions of siblings (about 0.30). The association between siblings is larger than the association between fathers and children or mothers and children (about.20). Moreover, all correlations are stronger for boys than for girls.

Table 7.5: Spearman Correlations between number of convictions of family members

	Spearman Rho	N
Sibling – Child [a]	0.31	3298
Siblings (Girls)	0.29	1642
Siblings (Boys)	0.36	1657
Father – Child	0.24	5831
Father – Daughter	0.23	2884
Father – Son	0.29	2947
Mother – Child	0.19	5831
Mother – Daughter	0.17	2884
Mother – Son	0.23	2947
Father – Mother	0.21	5831

Note: all significant at p <.01

[a] 2533 out of the 5831 children do not have an older sibling

Results Multilevel Analysis

We have now established that there exists a moderately strong association between convictions of parents and their children and between siblings. These relations were predicted by the six mechanisms leading to intergenerational continuity in criminal behavior as proposed by Farrington et al. (2001). In our following analysis, we investigate the development of criminal convictions by conducting a multilevel logistic regression model that evaluates the odds of a conviction in a given year. Two of the mechanisms proposed by Farrington assumed that maternal or sibling criminality would explain the relation between paternal convictions and the development of individual criminal behavior. According to the explanation of assortative mating, the maternal convictions would account for the relation between paternal criminal convictions and convictions of the child. According to learning and imitation theories, convictions of the sibling would explain part of the relation between criminal convictions of fathers and children.

We have constructed a data file containing a record for every year within every child after the 12th birthday. When a child died, no records after the death were included.

The file contains 100,607 person-years and 5,831 individuals nested within 2,944 families. For every year we analyze whether a child was convicted of one or more criminal acts (1) or not (0). Using the package lme4 in R (Bates & Maechler, 2009), we used logistic regression analysis to estimate the chance an individual has to commit one or more criminal acts in a year. We account for the clustering of multiple years (1) within children (2) and multiple children within (3) fathers using hierarchical models (3 levels). In Table 7.6, we estimate three models. We first estimate a model predicting the effects of the numbers of convictions of fathers. In model 2 and 3 the numbers of convictions of mothers and siblings are added. We will also estimate the effects of some controls. We model the age effect with two log variables (Blossfeld & Huinink, 1991). The first log variable (log(age-11) indicates the gradual decrease after the peak, while the second (log(40-age) displays the initial rise.[22] Also, we distinguish women (1) from men (0). Third, we take into account the number of children within a family. Finally, we will take into account whether parents are divorced (1) or not (0).

The results of model 1 show that the two age-measures are both significant. The results show that the age-crime curve is asymmetrical. Again, the peak is to the right of the middle ((40 + 12)/2 = 26). The estimations are similar to the estimations of the age-parameters in the previous chapters. Model 1 also shows that women are less likely than men to commit a crime in every year and that chances of a conviction are higher in the years that parents are divorced. Again, these findings replicate the results of the analyses in the previous chapters. As expected, the effects of the numbers of criminal convictions of the father are significantly positive. Persons having a father who is convicted of a crime have an elevated risk of being convicted themselves. For example, individuals with fathers who were convicted more than five times have an odds of conviction that is over seven times as high as individuals with law-abiding fathers.

[22] Because many studies have shown an asymmetric relationship between age and the chance of criminal behavior (it would rapidly increase during adolescence, peak in the early twenties and then gradually decrease (cf. Gottfredson & Hirschi, 1990; Moffit, 1993)), the use of two log variables will probably fit the data better than simply including an additional quadratic age term.

Table 7.6: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 5,831; $N_{person\text{-}years}$ = 100,607)

	Model 1				Model 2				Model 3			
	B		SE	Exp (b)	B		SE	Exp (b)	B		SE	Exp (b)
Intercept	-10.41	**	.30		-10.38	**	.30		-10.46	**	.31	
log (age-11)	1.21	**	.05	3.35	1.21	**	.05	3.35	1.21	**	.05	3.35
log (40- age)	.82	**	.05	2.27	.82	**	.05	2.27	.81	**	.05	2.25
Sex (Female =1)	-2.19	**	.09	.11	-2.17	**	.09	.10	-2.20	**	.09	.09
Number of children within the family	.03		.03	1.03	.01		.03	1.03	-.03		.03	.97
Parental divorce	.46	**	.08	1.58	.41	**	.08	1.51	.40	**	.07	1.50
Convictions of father (ref no convictions)												
1 conviction	.68	**	.22	1.97	.67	**	.22	1.95	.64	**	.21	1.91
2-5 convictions	1.27	**	.19	3.56	1.24	**	.19	3.45	1.12	**	.18	3.06
More than 5 convictions	1.99	**	.19	7.32	1.82	**	.19	6.17	1.64	**	.18	5.15
Convictions of mother (ref no convictions)												
1 conviction					.92	**	.18	2.51	.85	**	.17	2.33
2-5 convictions					1.17	**	.18	3.22	1.04	**	.17	2.83
More than 5 convictions					1.44	**	.27	4.22	1.34	**	.25	3.82
Convictions of siblings (ref no convictions)												
0.1-1 convictions									.65	**	.17	1.91
1.1-5.0 convictions									.97	**	.17	2.64
> 5.0 convictions									1.44	**	.11	4.22
No older sibling									.37	**	.11	1.44
Intercept variance level 2	2.46		1.57		2.52		1.59		3.41	*	1.84	
Intercept variance level 3	1.60		1.27		1.35		1.16		.34		.58	
-2log-likelihood	-13830				-13790				-13771			

In Model 2, the numbers of convictions of mothers are added to the model. This allows us to ascertain the degree to which maternal criminal convictions account for the association between the criminality of fathers and children. We will be able to test whether the assortative mating explanation applies. The results show that mothers and fathers have unique effects on an individual's probability of conviction. Compared to the parameters in Model 1, the influence of fathers declines by only a modest amount, and does so mostly at the high end of the mean conviction scale. For example, the partial odds ratio for having a father with more than five convictions declines from 7.32 to 6.17.

As the relation between convictions of fathers and the convictions of individuals is only modestly explained by the numbers of convictions of mothers, assortative mating will certainly not be the only mechanism leading to the association between paternal convictions and convictions of the child. It could be that fathers transmit criminal behavior to a small extend via maternal behavior to their children, but other processes will account for the larger part of the transmission.

In Model 3, we control for the criminal convictions of the older siblings. This will allow for the testing of the learning and imitation mechanism. Model 3 shows that all family members (fathers, mothers and siblings) exert an independent influence on the chance an individual has of being convicted. Influences of all family-members appear in the same order of magnitude. Individuals having no siblings (only children) appear to have a slightly higher chance of conviction than those with law-abiding siblings. However, sibling criminality also fails to substantially diminish the magnitude of the relationship between convictions of fathers and convictions of children. The partial odds ratio for having a father with more than five convictions declines from 6.17 to 5.15. The number of criminal convictions of older siblings explain the association between criminal convictions of father and the chance of criminal convictions of a child only to a very limited extent. Of course, this does not imply that learning mechanisms fail to explain criminal behavior all together. Learning mechanisms offered relatively good predictions in previous chapters. We have to conclude, however, that the convictions of older siblings do not offer an adequate explanation for the association between criminal convictions of fathers and their children. The hypothesis that older siblings learned their behavior from their fathers and younger siblings subsequently learned the behavior from their older siblings does not find support by these results.

7.6 Conclusions

The aim of this final empirical chapter was to investigate two more aspects of the intergenerational transmission of convictions: the convictions of mothers and the convictions of siblings. Also, we wanted to investigate to what extent the criminal convictions of a) mothers and b) siblings explain the relation between criminal convictions of fathers and the development of criminal careers of children.

In this chapter, we presented six mechanisms explaining the relation between criminal convictions of fathers and the convictions of children. All these mechanisms predicted associations between the criminal convictions of family members (mothers, fathers and siblings). Two mechanisms offered specific additional predictions about the extent to which maternal convictions and convictions of siblings could explain the association between criminal convictions of fathers and children. First, the assortative mating-mechanism states that maternal convictions will allow for the explanation. According to this mechanism, men with a criminal history have a higher likelihood of marrying and procreating with women who also have a criminal history as well. These women will be less fit to raise children, putting their children at risk and increasing the chance that they themselves become involved in crime. Second, the learning and imitation mechanisms states that convictions of the sibling will explain part of the relation between criminal convictions of fathers and the convictions of children. According to learning theories, children learn criminal behavior by observing and modeling the behavior of their parents. However, brothers and sisters could learn attitudes and behaviors directly from each other as well. The remaining four mechanisms predicted that maternal and sibling criminality would be unable to explain the relation between criminal convictions of fathers and the development of criminal behavior of individuals.

The results show a strong association of convictions between fathers and individuals, mothers and individuals and the older siblings and individuals, as expected from the six proposed mechanisms. The correlation between the number of convictions of siblings was about 0.30, a relationship that holds for male as well as female siblings. There was a less strong correlation between the criminal convictions of parents and the convictions of their children, of the order of about 0.20. Analyses also showed that maternal criminality and sibling criminality could to a very small extent account for the similarity in criminal convictions of fathers and children. The larger part of the association between the convictions of fathers and children remains intact. Both the predictions from the assortative mating- explanation as well as the explanations of the learning-perspective receive little support. It appears that other factors –as proposed in the four

remaining mechanisms- are responsible for the intergenerational transmission of criminal convictions.

It should be noted that, in this chapter, we find somewhat weaker correlations between convictions of family members than earlier research (e.g. Rowe and Farrington, 1997). The differences in sampling could account for the discrepancy. In the CSDD, criminal children and their families are investigated, while we investigate criminal fathers and their families. Also, differences between the United Kingdom and the Netherland's could play a role. We do, however, find an independent effect of all family members on the convictions of individuals, which is in line with the findings of Rowe and Farrington.

Chapter 8

Conclusions and Discussion

8.1 Introduction

This thesis has focused on the effect of criminal convictions of fathers on the criminal convictions of their children. An explicitly dynamic point of view was taken, centered on the development of criminal convictions over time. Two research questions were central: (1) *To what extent do paternal criminal convictions affect the development of criminal convictions of children over the life course?* (2) *To what extent do (a) the timing of paternal criminal convictions, (b) parental divorce, (c) paternal imprisonment and (d) maternal and sibling criminality explain the development of criminal careers of individuals over the life course?*

We tested the predictions from the perspective of two (competing) developmental criminological traditions. The first tradition comprises the group of 'static theories'. These theories state that the tendency for criminal behavior is established very early in childhood and remains stable thereafter. According to static theories, life changes after childhood (e.g. divorce of the parents and criminal behavior of the parent) do not alter one's likelihood of committing crime. The second tradition encompasses the 'dynamic theories', which assume that – in contrast to static theories – life circumstances do influence the development of individuals' criminal careers.

In order to study the intergenerational transmission of convictions and to test the assumptions from the criminological theories, we analyzed unique administrative data of the Criminal Career and Life Course Study (CCLS) concerning the complete criminal life courses of 3,015 criminal men and their 6,921 children. Also, the life courses of a control group consisting of 485 non-criminal fathers and their 1,066 children were analyzed.

In our study, we made scientific progress in four ways. First, we introduced new research questions by focusing explicitly on the development of criminal life courses and by adopting a broad definition of intergenerational transmission. Second, we made theoretical progress by testing hypotheses from two competing theoretical perspectives against one another and by applying established theories to a new setting. Third, we made scientific progress by using unique, prospective and longitudinal data. Fourth, we made progress by applying advanced research methods like trajectory analysis and fixed effect panel models to the research topic of the intergenerational transmission of convictions.

This final chapter first summarizes the findings of this study (sections 8.2 and 8.3). It then offers a concluding answer to the two central questions of this thesis (section 8.4). Section 8.5 discusses the implications of the findings for criminological theories. Additionally, the strengths and weaknesses of the study are discussed (8.6) and suggestions are made for future research (8.7) and for policy (8.8).

Table 8.1: Research questions, methods and main findings of the empirical chapters

Chapter	Research Questions	Methods	Main Findings
Chapter 3	- To what extent does intergenerational transmission of convictions exist? -To what extent do criminal careers of children differ between those with non-criminal fathers and those with fathers belonging to a group of persistent recidivists?	Trajectory analyses	-Number of convictions of fathers relate substantially to the number of convictions of children -Children from persistent criminals commit more delinquent acts in every phase of their lives
Chapter 4	-To what extent is the intergenerational transmission of convictions dependent upon the timing of the criminal acts of fathers? -To what extent do static and dynamic theories explain the intergenerational transmission of convictions?	Multilevel logistic regression	-Clear effects of the exact timing of criminal acts of fathers -Support for dynamic theories
Chapter 5	-To what extent does parental divorce affect the subsequent criminal convictions of individuals? -To what extent does the impact of parental divorce depend on the criminal convictions of fathers?	Multilevel logistic regression/fixed effect panel models	-Divorce causally increases the likelihood of convictions of children -Effect of paternal divorce smaller in criminal families
Chapter 6	-What is the long-term effect of paternal imprisonment on the development of criminal behavior of children? -To what extent do (a) the timing and (b) the duration of paternal imprisonment influence the development of criminal behavior of children?	Multilevel logistic regression	-Paternal imprisonment during childhood does not alter the shape of the development of criminal careers, but to a small extent does alter the heights of the curves
Chapter 7	-To what extent do criminal convictions of (a) mothers and (b) siblings explain the relationship between criminal convictions of fathers and the development of criminal careers of the children?	Multilevel logistic regression	-Maternal and sibling criminality does explain the relation between conviction of fathers and children, but to a very small extent

Table 8.1 sets out the research questions that were addressed in each chapter, as well as the methodology used and the key findings. The first empirical chapter (chapter 3) focused on answering the first central question of this thesis and established the extent of the transmission of paternal criminal convictions to the development of children's criminal careers. The focus from chapter 4 onwards was on answering the second central question, investigating various aspects of the intergenerational transmission of crime.

8.2 The extent of the intergenerational transmission of convictions

Chapter 3 described the relationship between criminal convictions of fathers and criminal convictions of their children. The description started by establishing cross-sectional relations. Gradually, the focus shifted to investigation of the development of criminal careers among the children.

Chapter 3: The relationships between conviction trajectories of fathers and their children

The results of the cross-sectional analyses in chapter 3 show that the number of convictions of a father relates substantially to the number of convictions of his children. The relationship remains substantial, even after controlling for age and sex. These findings are in line with findings from previous research. After establishing the cross-sectional relations, we used the criminality of the fathers to predict the criminal trajectories of children. Trajectory analysis pointed to the existence of four groups of criminals among the criminal fathers ('sporadic offenders', 'low rate desisters', 'moderately high desisters' and 'high rate persisters'). The chance of a conviction is especially high among the children of fathers belonging to the most criminal groups (the 'moderately high desisters' and the 'high rate persisters'). Children of persistent criminals tend to commit more criminal acts in every phase of their life and to start their criminal careers much earlier in life. Trajectories of children of fathers in the less criminal group (the 'sporadic offenders') are characterized by a low chance of convictions throughout their life course.

The next step in the analyses in chapter 3 was a semi-parametric group-based trajectory analysis on the complete criminal careers of the children. These results show that within the 7,987 children, four groups of children can be distinguished, each with a specific conviction trajectory. The first group consists of the vast majority of children (about 74%) who have no convictions. The other groups, called 'moderate desisters', 'early desisters' and 'chronic offenders' contain, respectively, 15%, 7% and 1% of the children. These groups range from 1 or 2 convictions among the 'moderate desisters' to

much more numerous convictions (>15) among the 'chronic offenders'. The final step in the analyses in chapter 3 was to combine the trajectory analyses of fathers and their children. This showed that having a father belonging to a more persistent group results in a higher chance of belonging to that trajectory group as well. Results of chapter 3 thus show moderately strong associations between criminal convictions of fathers and children. Furthermore, the development of the criminal careers of children appear to be very similar.

8.3 Different aspects of the intergenerational transmission of convictions

The second part of this thesis investigated various aspects of the intergenerational transmission of crime. This enabled us to introduce new research questions and offered possible explanations for the extent of the transmission. Also, it allowed further testing of the two groups of criminological theories. We analyzed the influence of the timing of paternal convictions (chapter 4), the influence of parental divorce (chapter 5), the influence of paternal imprisonment (chapter 6) and the influence of convictions of mothers and siblings (chapter 7).

Chapter 4: The timing of paternal convictions

Chapter 4 began the testing of the two major groups of developmental criminological theories. In this chapter, the influence of the timing of the criminal acts of fathers was central. The research question was: *To what extent does the timing of a father's convictions influence the development his children's criminal convictions?* We thus analyzed whether an individual's chance of having a conviction was higher in the years following a paternal criminal conviction. Static theories, which assume that criminal behavior is explained by persistent heterogeneity, predict that only circumstances in early childhood can influence a child's chance of a conviction. According to static theories, a relationship does exist between the number of criminal acts of a father and those of his children, but this relation is spurious. Fathers who commit a lot of crime have little self-control and as a result are inadequate child-raisers. Hence, children grow up having little self-control and committing crime as well. According to the static theories, the timing of the criminal convictions of fathers does not matter whatsoever. Dynamic theories, on the other hand, state that numerous life changes (also after early childhood) influence the chance of committing crime. Dynamic theories do predict an influence of the timing of the father's criminal convictions. According to dynamic learning theories,

children can learn criminal behavior from their father. Thus, in the years after a father's criminal conviction, his children have higher chances of convictions.

The findings of chapter 4 show that heterogeneity effects do indeed exist. To a large extent, the life courses of children appear to be influenced by the total number of criminal acts fathers commit. These findings are in line with the static theories. However, in addition to the population heterogeneity effects, our results also provide evidence for the dynamic perspective (and more specifically for the learning theories). Our results show that the timing of the father's convictions clearly affects the development of the criminal convictions of his children. The chance of a conviction rises in the years after a father is convicted (the learning effect). This effect diminishes with time (the decay effect). With each subsequent criminal conviction the decay is slowed (reinforcement effect). The learning effect appears less strong after a divorce, upon which children usually see less of their father. The learning effect is stronger in adolescence, when bonds with fathers are important. Thus, the results of chapter 4 show rather convincing support for both the static perspective and the dynamic perspective. Paternal criminal convictions lead to differences among children in their tendencies to have convictions. Beyond that, the timing of paternal criminal convictions influences the development of criminal convictions in children's life courses. Children have a higher chance of a conviction in the years after their father was convicted.

Chapter 5: Parental divorce in criminal families

Chapter 5 put the two groups of criminological theories to a second test. In this chapter, the influence of parental divorce is central. More specifically, we analyzed whether the effect of parental divorce on the criminal careers of children is causal or due to selection. In addition, we studied whether the effect of parental divorce was different in criminal and non-criminal families. Static theories predict that a parental divorce occurring after early childhood would not causally affect the development of criminal careers. However, dynamic theories hold that parental divorce even in adolescence would causally influence the development of criminal careers among children.

The findings of chapter 5 mostly support the dynamic theories of crime. The results of the multilevel logistic regression analyses show that in the years following a divorce, children have a greater chance of a conviction. In a fixed effect panel analysis, which is much more suited to study causal effects, the effect of divorce remains. Chapter 5 also showed that the effect of a parental divorce on children's development of a criminal career is about the same in criminal and in non-criminal families. The findings of chapter 5 are mostly consistent with the predictions of the dynamic theories.

Chapter 6: The long-term effects of paternal imprisonment on criminal trajectories of children

Chapter 6 investigated whether paternal imprisonment affects the development of criminal convictions of children. This chapter specifically focused on criminal convictions of children who had already reached adulthood (18–30 years old) in order to appropriately establish the causal order.

We tested hypotheses on the timing and the duration of paternal imprisonment. According to trauma theories, paternal imprisonment has the largest effect if it occurs during childhood, because of the trauma due to separation. Learning theories predict that paternal imprisonment in adolescence is most important, because children are more aware of the behavior of their father in that phase of life. Most theories assume that the longer the paternal imprisonment endures, the larger the possible effects on the criminal convictions of children will be. However, learning theories also state that during the period a father is imprisoned, children are unable to learn from his criminal behavior. Hence, the period of imprisonment could also lead to fewer convictions of children.

The results show that paternal imprisonment during childhood does not alter the shape of the development of a criminal career, but does (to a very small extent) alter the height of a criminal trajectory (higher intercepts). Children whose fathers were in prison before they were aged 12 have a much higher chance of conviction in each year from their 18th until their 30th birthday. When the father's criminal history and other characteristics are controlled for, the influence of parental imprisonment is much reduced, but remains significant. Having a father in prison between ages 0 and 12 thus has a small effect on the development of criminal convictions in adulthood. The results of this chapter are similar to those of research by Murray, Janson and Farrington (2007) in Sweden. These authors found few differences in criminal outcomes between children whose fathers were jailed when they were between 0 and 6 years old, and those whose fathers were jailed when they were between 7 and 19 years old.

We found some support for the existence of a dose-response relationship between paternal imprisonment and child convictions. Having a father who is imprisoned for a longer period of time results in a higher chance of a conviction. However, after controlling for the father's criminal history, the effect becomes very small. All in all, paternal imprisonment has very little effect on the development of criminal convictions of children.

Chapter 7: The association of criminal convictions among family members

In the final empirical chapter, we focused on the associations between criminal convictions of individuals and their fathers, mothers and siblings. In addition, we

investigated whether and to what extent maternal and sibling convictions explain the relation between criminal convictions of fathers and convictions of their children.

Six mechanisms were presented explaining the relationship between the criminal convictions of a father and those of his children (Farrington et al., 2001). Two of these offered predictions about the extent to which maternal convictions and convictions of siblings explain the association between criminal convictions of fathers and children. First, the assortative mating mechanism states that maternal convictions provide the explanation. According to this mechanism, men with a criminal history are more likely to marry and procreate with women who have a criminal history as well. These women are less fit to raise children, putting their children at risk and increasing the chance that these children themselves will become involved in crime. Second, the learning and imitation mechanism states that convictions of a sibling explain part of the relation between criminal convictions of fathers and the convictions of their children. Learning theories state that children learn criminal behavior by observing and modeling the behavior of their parents. However, brothers and sisters could learn attitudes and behaviors from one another as well.

The results show a strong association of convictions between fathers and their children, between mothers and their children, and between older and younger siblings. The correlation between the numbers of convictions of siblings is about 0.30, a relationship that holds for male as well as female siblings. There is a less strong correlation between the criminal convictions of parents and the convictions of their children, of the order of 0.20. Analyses, furthermore, show that the convictions of mothers and siblings could to a very small degree account for the similarity in criminal convictions of fathers and children. The larger part of the association between the convictions of fathers and children remains intact. There is thus little support for either the assortative mating explanation or the learning perspective. It appears that other factors are responsible for the intergenerational transmission of criminal convictions. All in all, results of chapter 7 show that criminal convictions of all family members are correlated and that criminal convictions of mothers and siblings explain little of the association between convictions of fathers and their children.

8.4 The answer to our two central questions

The first central question of this thesis was: *To what extent do paternal criminal convictions affect the development of criminal convictions of children over the life course?*

Our results show a moderately strong relation between the criminal convictions of a father and those of his children. We also found similarly shaped criminal trajectories among children with different criminal family histories. Children with criminal fathers do not begin or end their criminal career at another point in time than children with law-abiding fathers. However, children whose fathers have many convictions do have a higher chance of a conviction in every phase of life, compared to children with law-abiding fathers.

The second central question of this thesis – focusing on various aspects of intergenerational transmission – was: *To what extent do (a) the timing of paternal criminal convictions, (b) parental divorce, (c) paternal imprisonment and (d) maternal and sibling criminality explain the development of criminal careers of individuals over the life course?*

Our study found that the exact timing of criminal convictions of fathers does influence the development of criminal careers among children. Children have a higher chance of having a conviction in the years after their father is convicted of a crime. Similarly, children experiencing a parental divorce have a higher chance of a conviction in the years following the divorce. Paternal imprisonment was found to have limited influence on the development of the criminal careers of individuals. Children whose father was in prison while they themselves were aged 0 to 12 are slightly more likely to have a conviction. Convictions of mothers, siblings and fathers all correlate and exert independent influences on the criminal convictions of an individual. Maternal and sibling criminality are only to a small extent accountable for the relation between criminal convictions of fathers and those of their children.

8.5 What about the theories?

This section summarizes and weighs the results of the different chapters in light of the two groups of theories presented. Additionally, we describe the theoretical merits and drawbacks of this study.

Theoretical confirmation and refutation

Two theoretical paradigms were central in this thesis. Both consist of a group of developmental criminological theories making comparable assumptions about the origin and development of crime over the life course. The static theories of crime, on one hand, assume criminal behavior of individuals to be stable during the life course. According to the static perspective, people differ in their tendency to commit crime (population heterogeneity), but individuals' tendencies remain stable during the life course. Dynamic theories, on the other hand, assume that life circumstances can alter one's criminal career. This perspective is often referred to as 'state dependence'. Within the group of dynamic theories, however, several theories allow for the existence of population heterogeneity and predict effects of life course changes on top of the heterogeneity effects. Thus, while most dynamic theories do not exclude the predictions of the static theories, static theories are much more rigorous, stating that population heterogeneity is the only process leading to differences in criminal behavior between individuals. In this study, the self-control theory (Gottfredson & Hirschi, 1990) represented the notions of the static perspective. Representing the dynamic perspective were the differential association/learning theory (Sutherland et al., 1990) and the age-graded theory of informal social control (Sampson & Laub, 1990).

Throughout this thesis, we found support for the static theories. We found similar criminal trajectories among children with criminal fathers and children with law-abiding fathers. The total number of criminal convictions of a father, the criminal trajectory group to which the father belonged, and the duration of paternal imprisonment did not alter the shape of the criminal trajectory. The heights of the curves, however, were influenced by paternal criminality. The finding that the criminal trajectory of children of fathers with different criminal histories differs only in height and not in shape is consistent with predictions of the self-control theory, which states that all individuals have similar age-crime curves.

However, we also found evidence that contradicts predictions of the static theories and supports the notions of the dynamic theories. The exact timing of paternal convictions, for example, does influence the shape of the criminal careers of children,

while, according to the self-control theory, no such effect of timing should exist. Chapter 4's results indicate that in the years following a paternal conviction, children have a higher chance of a conviction themselves. These effects are also found when the differences in the total number of criminal convictions of fathers are taken into account. The findings are in line with the reasoning of the differential association theory, which states that children learn criminal behavior from their parents.

Moreover, according to static theories, no causal effects of parental divorce should exist. However, we found effects of parental divorce on the development of criminal behavior among children, using fixed effect panel models. In the years following a parental divorce, children have a higher chance of a conviction than in the years preceding a parental divorce. This finding is consistent with the predictions of the age-graded theory of informal social control. According to this theory, changes in bonds with important people can alter one's chance of committing a crime. A parental divorce changes bonds with parents, resulting in a higher chance of a conviction.

Next to the support found for dynamic theories, we also found some refutation. According to the notions of learning theories, criminal behavior is learned more effectively from persons relatively close in age. However, sibling criminality accounted for only a very small part of the association between criminal convictions of fathers and their children. Learning theories were also refuted with regard to the effects of imprisonment. Imprisonment during early childhood has the largest effect on the criminal careers of children, while learning theories assume that the influence of paternal imprisonment during adolescence would be greater.

In the final empirical chapter, chapter 7, we tested the assortative mating explanation. This states that criminal behavior is transmitted from a criminal father to his children via his choice of spouse. According to this line of reasoning, criminal men tend to marry criminal spouses, and criminal spouses are less able to properly raise children. Our results, however, show that criminal convictions of mothers do not explain the association between criminal convictions of fathers and those of their children. This refutes the assortative mating mechanism. Future research could test the mechanism differently, for example, focusing not only on the convictions of the mothers but also on other kinds of unadjusted behavior. Different testing could, of course, lead to different conclusions about the assortative mating explanation as well.

The main conclusion concerning the theories in this thesis is that predictions derived from both static theories and dynamic theories face refutation as well as confirmation. Our results show that theories which state that population heterogeneity is solely responsible for variations among people in their criminal behavior are too simplistic. Nevertheless, theories which state that only differences and changes in the life course are responsible for this variation are too simplified as well. Predictions of the self-

control theory, which leaves very little room for changes in an individual's criminal life course, are thus falsified. Indeed, the shapes of average age-crime curves appear very much alike. However, within these average age-crime curves there exists a lot of within-group variation. All kinds of circumstances (e.g. criminal acts of fathers and parental divorce) were found to affect the development of criminal careers among children. Hence, a dynamic theory, like the age-graded theory of informal social control, which offers room for both population heterogeneity and life course changes, fits best with the results of this study.

Theoretical merits & drawbacks

In this study, we made some important theoretical improvements. The first improvement was our application of theories from the tradition of the intragenerational transmission of crime to a new setting: the intergenerational transmission of crime. Traditionally, research on the intergenerational transmission of crime focused merely on cross-sectional associations between paternal and offspring criminality. This study investigated the transmission from an explicitly dynamic point of view: We analyzed the influence of paternal criminal convictions on the development of complete individual criminal careers. This approach enabled us to test developmental criminological theories, which had not yet been used in an intergenerational setting. We stretched the assumptions and predictions of the original developmental theories in order to apply them to the intergenerational setting, allowing for a more stringent testing of these theories' assumptions. While the developmental theories of crime were originally designed to provide insight into the criminal life courses of individuals, they proved useful in explaining intergenerational transmission as well.

The second theoretical improvement consisted of the systematic testing of the notions of two competing groups of theories against one another. Our results show refutation as well as confirmation of both static and dynamic theories, with slightly more evidence confirming the latter.

Next to the theoretical progress, there were also some theoretical drawbacks. The first drawback has to do with the fact that we were unable to test the notions of several criminological theories. The mechanisms proposed by Farrington, therefore, remain largely untested in this study. All of the mechanisms predict an association between criminal convictions of fathers and those of their children. The administrative data used in this thesis, however, are insufficient for testing most of these. Hence, the outcomes of our analyses do not allow for differentiation between these mechanisms. For example, we were unable to test whether and to what extent genetic factors or

environmental factors account for the association between paternal and offspring criminality.

The second theoretical drawback is also linked to our use of administrative data. In order to arrive at differentiating predictions of the developmental and life course theories used in this study, we had to make some important assumptions. Though the predictions of the theories were tested, the assumptions themselves remain untested. For instance, in chapter 4 we found effects of the timing of paternal criminal convictions on the chance of children having a conviction. These findings confirm the predictions we deduced from the differential association theory. However, the 'true' mechanism of the learning theories – the learning process itself – remains untested. Also, although we tested the predictions of the self-control theory, we were unable to provide a measurement of self-control. Moreover, we were unable to test the extent to which parental upbringing is responsible for differences in self-control among children. Many assumptions made in this thesis thus remain untested.

8.6 Pros and cons of the CCLS

Compared to previous research, we made important improvements concerning data, the design of our study and the analyses applied. First, the dataset is much larger than datasets used in previous research and this allowed for advanced statistical testing. Second, the follow-up period extends well beyond the 'most criminal' years, making it possible to investigate criminal careers up until the age of 40. Third, the design offers a control group, enabling proper testing of intergenerational transmission and comparison of the effects of divorce in criminal and non-criminal families. Fourth, this study not only gives detailed insights into the transmission of convictions from parents to their children, but it also investigates negative circumstances strongly related to paternal criminal convictions: parental divorce, paternal imprisonment and convictions of mothers and siblings.

Official data

Although the data used in this study have multiple advantages, there are also drawbacks. Most of these are the result of the official nature of the data. In studying criminal behavior, one might ask people about their behavior or collect information about their behavior from other sources. In this study, we only collected information about criminal behavior from official sources.

Using official data surely has its merits. Official data avoids problems that arise when people are asked about their criminal behavior. One need not worry about social desirability bias. Second, there are no memory lapses, as everything is documented. Also, taking into account the size and the extent of the time period of the CCLS sample, it would not be feasible to collect such data otherwise. The data used in this study are in our opinion the best data available to analyze the intergenerational transmission of crime.

This does not imply that using official data does not have disadvantages, limitations and problems. The main limitation is the lack of control variables. Important controls were surely omitted from our analyses. Key control variables would be education of both parents and children, income of parents, the neighborhood the children grew up in and the school they attended. In chapter 4, for instance, we introduced specific learning mechanisms which we were unable to test directly. Ideally, we would have liked to also have information, for instance, about parenting strategies and about the amount of contact children had with their parents.

A second problem with the official data used in this study is that the criminal convictions of children are not measured until their 12th birthday. Under Dutch law children under the age of 12 cannot be convicted of crimes. Ideally one would also want to know about the behavior of children before their 12th birthday. As self-control theory states that the principal cause for committing crime – the level of self-control – is entirely formed before the age of 12, a proper test of the assumptions of the self-control theory would also include information about the criminal behavior of children before they reached this age.

A third problem resulting from our use of official data is that a large number of criminal acts do not appear in our dataset. Of course, not every criminal act is noticed by the police and eventually leads to a conviction. In this study, we therefore analyzed an underestimation of the true amount of crime. As establishing the exact amount of crime among families is not the purpose of this study, the underestimation as such is not a major problem. The relations in this study would not be affected by an underestimation of the amount of crime alone. However, there are reasons to believe that the underestimation of crime is selective. In some families the underestimation is probably smaller than in other families. Especially in families with a criminal parent, it is possible that children will be under closer monitoring of the authorities, leading to a higher chance of them appearing in our data than children from families without criminal parents. Previous research (Hagan & Palloni, 1990) indicated that official data does reflect such selective monitoring. In that case, the associations found in this study between criminal convictions of fathers and children could possibly be overestimated. Nevertheless, such an overestimation would not influence the effects of the exact timing

of the paternal criminal convictions on the development of the criminal careers of individuals. Also, the overestimation would not influence the effects of a parental divorce.

Methodology

This study strongly focused on quantitative methods. Advanced statistical testing allowed for a detailed description of and insights into explanations for the intergenerational transmission of convictions. However, other more qualitative methods (e.g. in-depth interviews with members of criminal and non-criminal families and qualitative research into the penal files of families) would perhaps have allowed the testing of underlying assumptions which here remained largely untested.

For the most part, we executed multilevel logistic regression models with random intercepts. These models are useable for investigating the development of individual criminal careers. However, in order to make a stronger statement about the causal order, fixed effect panel models are sometimes more appropriate. Fixed effect panel models provide more stringent testing of causal effects, while using persons as their own controls. In chapter 5, we used both random and fixed effect panel models to investigate the causal influence of divorce. In the other chapters, we used multilevel analysis with random intercepts only. Especially in chapter 4, while focusing on the timing of parental criminal acts, fixed effect panel models would have been insightful. However, in chapter 4 we estimated an exponential decay function. We do not know of a software application for implementing exponential decay functions within fixed effect panel models, which resulted in our using traditional multilevel logistic regression analysis in chapter 4.

Other drawbacks

Another limitation of this study is the operationalization of the dependent variable. We chose to focus on the chance of an individual having a conviction and on the number of criminal convictions. This study did not distinguish between types of criminal acts. Thus, property crimes and violent crimes were not treated differently.

We also focused only on the situation of criminals in the Netherlands, which of course limits the generalizability of the results to an international context. Also, the fathers in this study were convicted in 1977, which means that the sample is not representative for the present population of Dutch offenders. For instance, the number of ethnic minorities in the Netherlands nowadays is much higher than it was in 1977. In our sample, very few members of ethnic minorities are included. Although the study is by

no means representative for the present Dutch population, we believe the relations found in this thesis will not be affected by this selection.

8.7 What next? Future research

Now that we have established the theoretical drawbacks of this study as well as the drawbacks of the Criminal Career and Life Course Study, we propose suggestions for future research. We first make suggestions for theoretical improvements. Then we make some other suggestions for future research to improve upon the current study.

Suggestions for theoretical improvements

This study has already made a number of theoretical contributions. Yet, two additional ways can be proposed to make further theoretical progress in future research.

Our first suggestion for theoretical improvement is to apply a broader definition of the self-control theory. In this study, we used a rather narrow interpretation of the theory. Overall, we stayed close to the original formulations of theories, as this allowed us to come up with competing hypotheses. While staying close to the original formulations of theories results in a proper testing of the assumptions of the original theories, a downside is that no improvement can be made on the theories as originally stated. Although applied to a new – intergenerational – setting, the results of this study appear to be very similar to the results of previous studies in which the notions of static and dynamic theories were tested against each other. We once again showed that the rigorous assumptions of the static theory cannot withstand empirical testing. Previous authors have also pointed out that the static viewpoint on the development of criminal behavior is a simplified rendering at best (Blokland, 2005; Tittle, Ward & Grasmick, 2003). This does not mean that static theories, such as the self-control theory, do not provide useful insights. Perhaps future tests of the assumptions of the self-control theory should focus on testing more generalized predictions and assumptions of the theory. Other scholars have applied a broader reading of the self-control theory, assuming that crime is a function of opportunities and self-control. We did not do so, because Gottfredson and Hirschi (2003) explicitly state that self-control and opportunities may interact for specific crimes, but in general are independent. One key assumption of the self-control theory is that (although self-control remains stable within individuals) each individual has more chance of committing crime in certain phases of their lives. The enlarged number of opportunities results in more criminal acts for everyone in some phases of the life course. It is with this line of reasoning that Gottfredson and Hirschi explain the universally acknowledged age-crime curve. Some scholars have interpreted this line of reasoning as

crime being a function of opportunities and self-control (e.g. Grasmick, Tittle, Bursik & Arnekev, 1993; Longshore, 1998). This interpretation could also be applied to the topic of intergenerational transmission and lead to new insights. Such an application, for example, might suggest predictions about the strength of associations over time (in times of economic hardship one could assume more opportunities because individuals have more time due to increased unemployment rates) or predictions about the strength of the intergenerational transmission within different families (e.g. depending on living arrangements and proximity to urban areas). Testing these predictions would offer more insight into the intergenerational transmission of crime. It would be interesting to apply a broader reading of the self-control theory (with an interaction between self-control and opportunities) to investigate intergenerational transmission. Focusing on opportunities to commit crime while investigating the intergenerational transmission of convictions could lead to new theoretical insights.

A second suggestion for theoretical improvement is to further integrate the notions of self-control theory with those of the age-graded theory of informal social control. Some predictions of the self-control theory withstand theoretical testing well, while others are repeatedly falsified. We would argue for the incorporation of the empirically valid notions of the self-control theory with the notions of dynamic theories, such as the age-graded theory of informal social control. In this new integrated theory, there should be a larger place for the population heterogeneity concept than is the case in the original formulation of the age-graded theory of informal social control. Also, effects of life course changes should be incorporated into this new integrated theory, albeit to a modest extent. This new integrated theory would do justice to the results of a large body of research.

Further suggestions for future research

Next to the theoretical improvements, there are several other ways to improve upon current studies. We therefore make some additional suggestions for future research.

While researching the topic of crime among parents and children, one immediately wonders to what extent the transmission is caused by genetic make-up. Yet a completely static view of crime was falsified in this study, thus exposing any theory proposing a solely biological cause of criminal behavior as too simplistic. A mere biological approach would also be unable to predict changes in crime over time, or differences among regions and countries. Still, questions about a genetic cause and about a possible interaction of genetic and societal and psychological factors have not yet been studied enough. These questions deserve more attention in future research.

A second suggestion for further research is to include more predictors of state dependence in the models. As we know from the literature (e.g. Blokland, 2005) prior offending influences one's chance of a future conviction. In our analyses, we did not control for prior offences. Of course, while investigating criminal careers it would be very interesting to learn whether past behavior (causally) influences future behavior. We encourage future researchers to investigate whether the prior offending of children intervenes with the transmission of criminal convictions of fathers to their children.

In this study we focused on two successive generations. Other studies (e.g. Bijleveld & Wijkman, 2009) analyze criminal behavior over more than two generations. It would be interesting to learn how the relations found in this study would change if we added an extra generation to the design. Does the strength of the associations remain?

This study focused (for the largest part) on the relation between fathers and their children. While the association between maternal and sibling criminality and the criminal behavior of individuals was investigated, this was done rather sparsely. Research focusing on the criminal behavior of mothers is in fact very scarce. Future research should focus more specifically on the relation between criminal convictions of mothers and children. Also, the influence of maternal imprisonment on the development of criminal careers of children should be investigated.

Other outcomes of paternal criminal convictions could be investigated as well. Of course, criminal behavior is not the only thing that can be influenced by the criminal convictions of fathers. All kinds of negative outcomes for children are more likely when a father commits crime. Other possible outcomes are teen pregnancy, poor school performance, dropping out of school and lower chances on the labor and marriage market. Future research could focus on these other consequences of the criminal behavior of fathers.

We furthermore suggest that future studies use multiple research designs. Several designs are appropriate for evaluating the influence the intergenerational transmission of convictions. The most methodologically robust way to investigate causal effects of paternal convictions on children would, of course, be to apply an experimental design. However, the nature of criminal behavior implies that, at best, research will be quasi-experimental. Twin and adoption studies could be used to establish the extent to which the association between paternal convictions and children's criminal behavior is genetically, versus environmentally, influenced. Longitudinal studies analyzing within-individual changes in criminal behavior starting before the age of 12 could test the effects of paternal convictions on children more strongly than was possible in this study. Future research, then, would do well to incorporate insights from quasi-experimental studies, twin and adoption studies, and longitudinal studies of within-individual change.

Another important new research topic is to investigate the intergenerational transmission of convictions again using the Criminal Career and Life Course Study, while further extending the present dataset. The data could be expanded with information on parental background, socio-economic status and parenting strategies. Extending the Criminal Career and Life Course Study would improve on many of the drawbacks of the present study, while retaining all of the present merits.

8.8 What next? Implications for policy

This final section formulates some suggestions for policy. This study shows rather convincingly that criminal convictions of fathers are strongly related to criminal convictions of their offspring. Although the testing of the exact mechanisms remains speculative, due to data limitations, the results are clear: Exposure to a criminal father increases the likelihood of a child being convicted. Also, we showed the effects of parental divorce on children's chances of conviction. Finally, we demonstrated that exposure to a criminal mother and criminal siblings increases the chance of convictions, independent of the criminal convictions of the father. These findings are valuable for policy purposes. Two applications of these results to practical policy can be mentioned to perhaps contribute to reducing criminality in Dutch society. The first suggestion relates to the prevention of criminal behavior. The second pertains to responses to and attempts to change criminal behavior.

First, some criminal behavior of children could possibly be prevented if more accompaniment was offered to convicted parents in the upbringing and parenting of their children. In the case of the Netherlands, several of these (or similar) programs already exist. Our results clearly show that children from very criminal families have a much higher chance of committing crime. Child protective services and other welfare agencies should investigate whether parents in criminal families are able to adequately recognize and punish delinquent behavior of their children. Also, after a divorce, parents should be made aware of the possible consequences of a parental divorce for the behavior of their children. They could be educated in how to respond to delinquent behavior and be offered assistance in parenting strategies. Furthermore, it would be sound to intensively involve family in the rehabilitation of convicted family members. Fathers who are convicted of criminal acts could, for example, be offered parenting courses or family counseling. Such courses could improve these parents' comprehension of the necessity of adequate parenting for the future well-being of their children. They could also improve the parenting skills of convicted fathers (and their spouses). Such a parenting course might even be offered on an obligatory basis, perhaps by court order.

Our second suggestion has to do with the response to criminal behavior. In order to reduce crime, one should focus on interventions that change the criminal careers of individuals and transform prior offenders into law-abiding citizens. This is a challenging task for policy makers.

The results of this study are most affirmative of the age-graded theory of informal social control. The key prediction of this theory is that bonds with family, education and work explain one's chance of a conviction. Applying this prediction to policy implies that rehabilitation should focus on the amplification of these bonds. Convicted criminals should be helped with education and their return to the labor market. Also, they should be assisted in restoring their relationship with their spouse and children, for instance, via family counseling. Establishing strong bonds with society will allow them to build a new life as a law-abiding citizen. Interventions focusing on the establishment of strong bonds would have highest chances sort some effect on recidivism, according to the results of our study. Policy research should make matters more clear.

Samenvatting (summary in Dutch)

Twee criminele generaties: de intergenerationele overdracht van veroordelingen over de levensloop

Inleiding en onderzoeksvragen

Verschillende onderzoeken hebben al aangetoond dat de samenhang tussen het criminele gedrag van ouders en het criminele gedrag van hun kinderen substantieel is (Besjes & Van Gaalen, 2008; Rowe & Farrington, 1997). Het bestaande onderzoek beperkt zich echter voornamelijk tot het beschrijven van samenhangen tussen de aantallen delicten van vaders en kinderen.

Daarbij vertonen de eerdere studies verschillende tekortkomingen. Wij signaleren 5 belangrijke tekortkomingen in de eerdere studies: ten eerste baseren de meeste studies hun resultaten op kleine steekproeven en gebruiken zij een retrospectief design. Daarnaast verzuimen de studies in te gaan op de effecten van ouderlijk crimineel gedrag op het gedrag van kinderen tot in de volwassenheid. Ten derde richten de meeste studies zich op zonen en niet op dochters. Ten vierde ontbreekt het de meeste studies aan een vergelijkbare controlegroep. Tenslotte worden verklaringen voor de transmissie van crimineel gedrag van ouders op hun kinderen nauwelijks getoetst.

In dit proefschrift zullen we het eerdere onderzoek op de bovenstaande 5 punten verbeteren. De eerste stap in dit proefschrift zal bestaan uit het vaststellen van de samenhang tussen criminele veroordelingen van vaders en de veroordelingen van hun kinderen. De eerste onderzoeksvraag in dit proefschrift is: *In hoeverre hangt het criminele gedrag van vaders samen met de ontwikkeling van de criminele carrières van hun kinderen?* In het eerste empirische hoofdstuk (hoofdstuk 3) beantwoorden we deze onderzoeksvraag.

De tweede stap in dit proefschrift zal bestaan uit een analyse van verschillende aspecten van het criminele gedrag van vaders. We hanteren een brede interpretatie van intergenerationele overdracht. Deze brede interpretatie biedt verschillende voordelen: allereerst zullen we nieuwe aspecten onderzoeken en nieuwe onderzoeksvragen introduceren. Daarbij leidt het hanteren van een brede interpretatie tot meer genuanceerde en gedetailleerde inzichten. Tenslotte leidt het onderzoeken van

verschillende aspecten van intergenerationele overdracht ook tot de mogelijkheid om criminologische theorieën aan een toets te onderwerpen. De tweede onderzoeksvraag die centraal staat in dit proefschrift is de volgende: *In hoeverre verklaren a) de precieze timing van veroordelingen van de vader, b) echtscheiding van de ouders, c) gevangenschap van de vader en d) veroordelingen van moeders en broers/zussen de ontwikkeling van criminele carrières van individuen over de levensloop?* In de hoofdstukken 4 tot en met 7 van dit proefschrift wordt de tweede onderzoeksvraag beantwoord.

Criminologische theorieën

Binnen de levensloop en ontwikkelingscriminologie is decennia lang een debat gaande over de stabiliteit van criminele levenslopen (o.a. Vold, Bernard & Snipes, 1998.; Nagin & Paternoster, 2000). Er zijn twee stromingen te onderscheiden. Vanuit deze stromingen hebben we in dit proefschrift hypothesen afgeleid over de invloed van het criminele gedrag van vaders op het gedrag van hun kinderen. We komen dan tot (deels) tegengestelde voorspellingen.

Eén groep criminologen houdt vast aan het idee dat er verschillen zijn tussen personen in hun geneigdheid delicten te plegen. In de literatuur wordt deze positie ook wel 'population heterogeneity' genoemd (Nagin & Paternoster, 2000). Zij stellen dat iedere persoon een bepaalde kans heeft op het plegen van delicten. Deze kans komt tot stand door bijvoorbeeld biologische oorzaken of door andere factoren in de vroege kindertijd. Gebeurtenissen die daarna plaatsvinden zouden geen invloed meer hebben op het criminele gedrag. Om deze reden worden de verklaringen behorende tot deze stroming ook wel de *statische theorieën* genoemd.

De bekendste statische theorie is de self control theory van Gottfredson en Hirschi (1990). De overdracht van crimineel gedrag van ouders op hun kinderen vindt volgens deze theorieën al heel erg vroeg in het leven van de kinderen plaats en is daarna onveranderlijk. De belangrijkste oorzaak van gebrekkige zelfcontrole zou liggen in het ineffectief opvoeden van de kinderen door de ouders. Wanneer ouders hun jonge kinderen niet goed in te gaten houden, corrigeren en bestraffen, zou de kans groter worden dat die kinderen een lage mate van zelfcontrole ontwikkelen. Gottfredson en Hirschi (1990) stellen dat ouders met veroordelingen hun kinderen evenmin zullen aanmoedigen om zelf delicten te plegen als ouders zonder veroordelingen. Maar, aangezien ouders met veroordelingen zelf weinig zelfcontrole zouden hebben en hun gedrag veelal gericht zou zijn op directe behoeftebevrediging, zijn zij veel minder goed in staat om kinderen op te voeden. Zij zullen criminele gedragingen minder vaak als zodanig herkennen en ook minder vaak corrigeren. Ouders met weinig zelfcontrole (en veel veroordelingen) verkrijgen via dit mechanisme dus ook kinderen met weinig zelfcontrole

(en veel veroordelingen). Gottfredson en Hirschi veronderstellen dat de mate van zelfcontrole na de kindertijd stabiel blijft. Volgens de statische theorieën kunnen er dus wel verschillen zijn in de kansen op het plegen van delicten tússen mensen, maar er kunnen geen veranderingen optreden bínnen individuen.

Een tweede groep criminologen veronderstelt dat de geneigdheid tot het plegen van delicten gedurende het leven van mensen kan veranderen. Deze positie wordt in de literatuur ook wel 'state dependance' genoemd (Nagin & Paternoster, 2000). Dit principe houdt in dat allerlei levensomstandigheden de kans om een delict te plegen kunnen beïnvloeden. Conventioneel gedrag, als het halen van een diploma of het vinden van een baan, verkleinen de kans van een individu om delicten te plegen, terwijl ondermeer het onderhouden van banden met criminele vrienden de kans om een delict te plegen kunnen vergroten (Sampson & Laub, 1990). Verklaringen uit deze stroming worden vaak aangeduid met *dynamische theorieën*. Dynamische theorieën voorspellen dat de geneigdheid tot het plegen van delicten kan veranderen gedurende het leven. Het gedrag van de vader kan volgens deze verklaringen ook na de kindertijd een belangrijke rol spelen bij het voorspellen van de criminele levenslopen van individuen. We gebruiken in dit proefschrift inzichten uit twee dynamische theorieën; de differential association theory (Sutherland, 1992) en de age graded theory of informal social control (Sampson & Laub, 1990).

De age graded theory of informal social control (Sampson & Laub, 1990) stelt dat bepaalde veranderingen in de levensloop de kans op het plegen van een delict kunnen veranderen. In verschillende perioden in het leven zijn verschillende banden en omstandigheden van belang. Tijdens de kindertijd en in de adolescentiefase zijn voornamelijk de banden met de ouders en het succes op school belangrijk. Daarna spelen bijvoorbeeld de banden met het eigen gezin (trouwen en kinderen krijgen) en het succes op de arbeidsmarkt een grote rol. Volgens de age graded theory of informal social control zou een echtscheiding van de ouders de kans op crimineel gedrag van kinderen bijvoorbeeld kunnen vergroten.

De tweede dynamische theorie die centraal staat in dit proefschrift, de differential association theory gaat ervan uit dat crimineel gedrag op dezelfde manier wordt geleerd als ander 'normaal geaccepteerd' gedrag. Het grootste gedeelte van het leren van crimineel gedrag vindt plaats in intieme persoonlijke groepen, zoals het gezin. Niet alleen de technieken die een persoon moet beheersen om crimineel gedrag te vertonen moeten worden aangeleerd, ook de motieven, waarden en houdingen die benodigd zijn om criminaliteit te plegen worden aangeleerd. Sterkere omgang met delinquenten zorgt ervoor dat mensen een grotere kans hebben dit allemaal aan te leren en crimineel gedrag te ontwikkelen (Sutherland, 1992; Akers & Jensen, 2003). Juist de

omgang met een criminele ouder, die een rolmodel vormt voor een opgroeiend kind, zou het criminele gedrag kunnen bepalen.

Data

In deze bijdrage maken we gebruik van de gegevens van de Criminele Carrière en Levensloop Studie (CCLS). De justitiële en levensloopgegevens van 4.271 willekeurig gekozen mannen die in 1977 zijn veroordeeld, zijn verzameld bij de dataverzameling van CCLS-veroordeelden (Nieuwbeerta & Blokland, 2003). Deze onderzoekspersonen zijn geselecteerd door middel van een representatieve steekproef van 4 procent van alle misdrijfzaken die in 1977 onherroepelijk werden afgedaan. Van deze onderzoekspersonen zijn de justitiële gegevens in 2003 opgevraagd bij het Algemeen Documentatieregister van de Justitiële Documentatiedienst. Deze gegevens bevatten informatie over alle veroordelingen van mensen. Het aantal veroordelingen is jaarlijks gemeten, beginnend vanaf het 12^{e} levensjaar (omdat de leeftijdsgrens om justitieel vervolgd te worden in Nederland 12 jaar is). De data omvatten dus alle informatie over alle veroordelingen na het 12^{e} jaar tot het moment van dataverzameling in 2005. De data geven alleen informatie over die delicten waarvoor een individu ook veroordeeld is. We nemen enkel misdrijven en geen overtredingen mee (verkeersovertredingen bijvoorbeeld worden niet meegenomen). De delicten die geanalyseerd worden in deze bijdrage zijn dus allemaal misdrijven; het betreffen zowel lichte vergrijpen (zoals winkeldiefstal) als zware misdrijven (zoals verkrachting en moord). Naast de justitiële data zijn er ook gegevens over geboorte, sterfte en trouwen opgevraagd bij de Gemeentelijke Basisadministratie (GBA) en het Centraal Bureau voor Genealogie (CBG).

De gegevens van het CCLS-veroordeelden zijn in 2005 uitgebreid met gegevens over de justitiële contacten van de kinderen. Uit gegevens van de GBA en het CBG blijkt dat de 4.271 mannen samen 6.921 kinderen boven de 12 jaar hebben gekregen. Van deze 6.921 kinderen zijn begin 2006 de justitiële gegevens met behulp van uittreksels uit het Algemeen Documentatieregister van de Justitiële Documentatiedienst (OBJD) verkregen. Daarnaast hebben we de beschikking over de gegevens van een controlegroep bestaande uit 485 niet-criminele mannen en hun 1.066 kinderen.

Hoofdstuk 3: De relatie tussen de criminele ontwikkelingspaden van vaders en hun kinderen

De resultaten van de cross-sectionele analyses in hoofdstuk 3 laten zien dat de aantallen veroordelingen van vaders substantieel samenhangen met de aantallen veroordelingen

van de kinderen. De samenhang blijft aanzienlijk, ook als we controleren voor leeftijd en geslacht. We gebruiken allereerst de criminele veroordelingen van vaders om de criminele ontwikkelingspaden van de kinderen vast te stellen. Trajectory analyse laat zien dat er 4 groepen criminele vaders te onderscheiden zijn (Sporadic Offenders, Low Rate Desisters, Moderate High Desisters & High Rate Persisters). De kans op een veroordeling is met name hoog voor kinderen met vaders uit de meest criminele groepen (de Moderate High Rate Desisters en de High Rate Persisters). Kinderen van persistente criminelen, hebben meer veroordelingen in iedere fase van hun leven en hebben hun eerste veroordeling op een wat jongere leeftijd. De ontwikkelingspaden van de kinderen van vaders uit minder criminele groepen (bijvoorbeeld de Sporadic Offenders) kenmerken zich door lage kansen op veroordelingen gedurende de gehele levensloop.

De volgende stap in de analyses in hoofdstuk 3 is een semiparametrische group-based trajectory analyse van de complete criminele carrières van de kinderen. De resultaten laten zien dat er 4 groepen met specifieke criminele ontwikkelingspaden kunnen worden onderscheiden. De grootste groep bestaat uit kinderen die geen enkele veroordeling hebben (ongeveer 74 %). De andere groepen (Moderate Desisters, Early Desisters en Chronic Offenders) bestaan uit respectievelijk 15, 7 en 1 % van de kinderen. Deze groepen kinderen hebben wel veroordelingen, variërend van 1 of 2 veroordelingen door de Moderate Desisters en een flink aantal (>15) door de Chronic Offenders.

Een laatste stap in de analyses in hoofdstuk 3 combineert de trajectory analyse van vaders met de trajectory analyse van kinderen en laat zien dat het hebben van een vader behorend tot een meer criminele groep resulteert in een hogere kans zelf ook tot een dergelijke groep te behoren. De resultaten van hoofdstuk 3 geven dus aan dat er een substantiële relatie tussen het aantal veroordelingen van vaders en kinderen bestaat. Hoewel de hoogtes van de criminele carrières (het aantal veroordelingen) variëren, blijkt er weinig variatie in het verloop van de criminele levenslopen van kinderen te zijn.

Hoofdstuk 4: De precieze timing van de veroordelingen van vaders

In hoofdstuk 4 beginnen we met het testen van de verwachtingen van de 2 ontwikkelingscriminologische theorieën. In dit hoofdstuk staat de invloed van de precieze timing van de veroordelingen van vaders centraal. De onderzoeksvraag in dit hoofdstuk is: *In hoeverre beïnvloedt de timing van de veroordelingen van vaders het verloop van de criminele carrière van zijn kinderen?* We toetsen hypothesen vanuit de twee theoretische stromingen: allereerst de voorspellingen uit de statische theorieën, die veronderstellen dat alleen omstandigheden in de zeer vroege kindertijd het criminele gedrag kunnen beïnvloeden. Volgens deze statische theorieën bestaat er wel een

verband tussen het aantal veroordelingen van vaders en kinderen, maar berust dit verband op schijn. Vaders die veel delicten plegen, hebben weinig zelfcontrole, kunnen geen kinderen opvoeden, waardoor hun kinderen ook weinig zelfcontrole verkrijgen. Als een gevolg daarvan plegen de kinderen ook delicten. De timing van de veroordelingen van vaders doet er volgens de statische theorieën in zijn geheel niet toe. Vervolgens introduceren we voorspellingen vanuit dynamische theorieën die stellen dat er ook na de vroege kindertijd allerlei factoren kunnen zijn die de criminele levensloop beïnvloeden. Deze theorieën stellen dat er wel degelijk een invloed uit zal gaan van de timing van de delicten van vaders.

Uit de resultaten van het onderzoek blijkt dat er inderdaad een statisch effect bestaat. De levenslopen van kinderen blijken behoorlijk beïnvloed te worden door de aantallen veroordelingen van vaders. Daarnaast blijken er ook duidelijke effecten te zijn van de timing van de veroordelingen van de vaders. Deze effecten geven ondersteuning voor de tweede stroming: de dynamische (leer)theorieën. Uit onze resultaten blijkt dat in het jaar waarin een vader een veroordeling heeft de kans op een veroordeling van het kind stijgt (een leereffect). Dit effect wordt met de tijd kleiner (een vervaleffect). Bij elke volgende veroordeling van een vader verloopt het verval echter wel minder snel (een bestendigingeffect). Ook blijkt het leereffect minder sterk te zijn na een echtscheiding, wanneer kinderen hun vaders meestal veel minder zien. Daarbij is het leereffect juist groter in de adolescentie, wanneer de banden met de ouders juist erg belangrijk zijn. Al met al wijzen de resultaten op een gemengd beeld. Zowel statische als dynamische factoren beïnvloeden de kansen op crimineel gedrag.

Hoofdstuk 5: Echtscheiding van de ouders in criminele families

In hoofdstuk 5 toetsen we de statische en dynamische theorieën voor een tweede keer. In dit hoofdstuk staat de invloed van echtscheiding van de ouders centraal. We analyseren of het effect van echtscheiding op de ontwikkeling van criminele carrières van de kinderen een causaal effect is of dat dit op selectie berust. Daarbij bestuderen we of het effect van echtscheiding verschillend was in criminele en niet-criminele families. Statische theorieën voorspellen dat echtscheiding van de ouders na de kindertijd geen causaal effect zal hebben op de ontwikkeling van criminele carrières van de kinderen. Echter, dynamische theorieën voorspellen juist dat ouderlijke echtscheiding de ontwikkeling van crimineel gedrag van kinderen wel causaal zal beïnvloeden.

De bevindingen van hoofdstuk 5 geven voornamelijk ondersteuning voor de dynamische theorieën. De resultaten van een fixed effect panel model, bij uitstek geschikt om causale invloeden te onderzoeken, laten zien dat kinderen een grotere kans

op een veroordeling hebben in de jaren na een scheiding van de ouders. Het effect van een echtscheiding van de ouders op de ontwikkeling van de criminele carrières van kinderen blijkt in criminele families even groot te zijn als in niet- criminele families. De bevindingen van hoofdstuk 5 geven ondersteuning voor de dynamische theorieën.

Hoofdstuk 6: De langetermijneffecten van gevangenschap van de ouders op de criminele levenslopen van kinderen

In hoofdstuk 6 onderzoeken we of gevangenschap van vaders een effect heeft op de ontwikkeling van de criminele veroordelingen van kinderen. In dit hoofdstuk richten we ons specifiek op de veroordelingen van kinderen die de volwassenheid reeds bereikt hebben (18-30 jaar oud), zodat we de causale volgorde adequaat kunnen vaststellen.

In dit hoofdstuk toetsen we hypothesen omtrent de timing en de duur van de gevangenschap. Volgens traumatheorieën zou men met name effecten van de gevangenschap van de vader gedurende de kindertijd van de kinderen verwachten door het trauma van de scheiding. Leertheorieën voorspellen juist grote effecten op het criminele gedrag van kinderen als de gevangenschap plaatsvond gedurende de adolescentie. In die levensfase zouden kinderen zich meer bewust zijn van het criminele gedrag van hun ouders. De meeste theorieën voorspellen dat een langere gevangenschap van de vader leidt tot grotere effecten op de kans op veroordelingen van de kinderen. Maar, stellen leertheorieën, gedurende de tijd dat een vader in de gevangenis zit, kan een kind niet meer leren van het criminele gedrag van de vader. Dus, de periode van gevangenschap zou ook kunnen leiden tot minder veroordelingen van de kinderen.

De resultaten van dit hoofdstuk laten zien dat gevangenschap van de vader gedurende de kindertijd de vorm van de criminele ontwikkelingspaden niet beïnvloedt, maar dat het wel de hoogte van de ontwikkelingspaden beïnvloedt (hogere intercepten). Kinderen van wie de vaders gevangen waren voordat de kinderen 12 jaar oud waren, hebben een veel hogere kans op een veroordeling van hun 18^{e} tot hun 30^{e} jaar. Als we controleren voor de criminele geschiedenissen van vaders dan wordt het effect van gevangenschap veel kleiner, maar blijft het significant. Het hebben van een vader in de gevangenis als het kind tussen de 0 en 12 jaar is, zorgt er dus voor dat de kans op een veroordeling in de volwassenheid een klein beetje groter is. De resultaten van dit hoofdstuk zijn vergelijkbaar met resultaten van onderzoek van Murray, Janson & Farrington (2007) in Zweden. Deze studie laat zien dat er maar erg kleine verschillen te

vinden zijn in de criminele gedragingen van kinderen wier vaders in de gevangenis zaten tussen hun geboorte en hun 6e verjaardag, noch tussen hun 7e en 19e jaar.

We vonden een klein beetje bevestiging voor onze hypothese dat een langere duur van de gevangenschap zou leiden tot meer veroordelingen van de kinderen. Nadat we controleerden voor de criminele geschiedenissen van de vaders werden de effecten van de duur van de gevangenschap echter klein en niet-significant.

De belangrijkste conclusie van dit hoofdstuk is dat er slechts zeer kleine effecten van gevangenschap van de vader op de ontwikkeling van veroordelingen van de kinderen blijken te zijn.

Hoofdstuk 7: De samenhang van veroordelingen tussen familieleden

In het laatste empirische hoofdstuk onderzoeken we de samenhang tussen criminele veroordelingen van vaders, moeders, broers/zussen en individuen. Daarbij onderzoeken we of en in hoeverre de veroordelingen van moeders en broers/zussen de samenhang tussen veroordelingen van vaders en kinderen kunnen verklaren.

In dit hoofdstuk presenteren we zes mechanismen die de relatie tussen de criminele veroordelingen van vaders en hun kinderen verklaren (Farrington, et al., 2001). Twee mechanismen bieden specifieke voorspellingen voor de mate waarin veroordelingen van moeders en broers/zussen een verklaring bieden voor de samenhang tussen veroordelingen van vaders en kinderen. Allereerst presenteren we het principe van 'assortative mating,' dat de veroordelingen van moeders als verklaring voor de samenhang tussen vaders en kinderen aandraagt. Volgens dit mechanisme hebben mannen met een criminele geschiedenis een grotere kans om te trouwen en zich voort te planten met vrouwen die ook een criminele geschiedenis hebben. Deze vrouwen zijn minder goed in staat om de kinderen op te voeden, waardoor deze kinderen grotere kans hebben om zelf ook veroordeeld te worden. Het tweede mechanisme met een specifieke voorspelling is het leermechanisme, dat stelt dat de veroordelingen van broers en zussen een deel van het verband tussen de veroordelingen van vaders en kinderen zou kunnen verklaren. Volgens de leertheorieën leren kinderen het criminele gedrag van hun ouders door het gedrag van hun ouders te observeren. Broers en zussen zouden de criminele houdingen en gedragingen echter ook direct van elkaar kunnen leren. Een deel van het verband zou op deze manier verklaard kunnen worden. De overgebleven vier mechanismen van Farrington (2001) voorspellen dat de veroordelingen van moeders en broers/zussen het verband tussen de veroordelingen van vaders en kinderen niet zouden kunnen verklaren.

De resultaten van dit hoofdstuk laten een sterk verband zien tussen de veroordelingen van vaders en individuen, de veroordelingen van moeders en individuen en de oudere broers/zussen en individuen. De correlatie tussen de aantallen veroordelingen van broers en zussen is ongeveer .30. De correlatie tussen de veroordelingen van ouders en kinderen is kleiner, in de orde van .20. Analyses laten verder zien dat veroordelingen van moeders en van broers en zussen maar een heel klein deel van het verband tussen veroordelingen van vaders en kinderen kunnen verklaren. Het grootste gedeelte van het verband blijft bestaan. De voorspellingen van de twee genoemde mechanismen (assortative mating en de leertheorieën) verkrijgen dus weinig bevestiging. Andere factoren zullen verantwoordelijk zijn voor de intergenerationele overdracht van veroordelingen.

Belangrijkste conclusies

De belangrijkste resultaten van dit proefschrift laten allereerst zien dat er een substantieel verband bestaat tussen veroordelingen van vaders en kinderen. Bovendien blijkt dat de precieze timing van de veroordelingen van de vader de ontwikkeling van de criminele carrières van de kinderen beïnvloedt. Kinderen hebben een hogere kans op veroordelingen in de jaren nadat een vader een delict heeft gepleegd. Daarnaast hebben we een causaal effect van de echtscheiding van ouders op de ontwikkeling van het crimineel gedrag van kinderen vastgesteld. Kinderen van wie de vader in de gevangenis zit als de kinderen 0 tot 12 jaar oud zijn, hebben ook een iets grotere kans op een veroordeling als ze volwassen zijn. Tenslotte blijkt dat veroordelingen van familieleden sterk samenhangen, maar dat veroordelingen van moeders en broers/zussen geen verklaring bieden voor het verband tussen veroordelingen van vaders en hun kinderen.

De belangrijkste conclusie omtrent de theorieën in dit proefschrift is dat zowel voorspellingen van statische theorieën als voorspellingen van dynamische theorieën bevestiging hebben verkregen. De resultaten laten zien dat theorieën die stellen dat enkel en alleen populatieheterogeniteit (of verschillen in geneigdheid tot crimineel gedrag) verantwoordelijk is voor de variatie in crimineel gedrag een te simpele weergave van de werkelijkheid zijn. Desalniettemin geven theorieën die stellen dat state dependence de enige verklaring is voor de variatie in crimineel gedrag ook geen juiste weergave. De voorspellingen van de self control theory, die weinig ruimte over laten voor veranderingen in de criminele levenslopen, worden met de resultaten van dit proefschrift aldus verworpen. Allerlei omstandigheden (zoals de criminele veroordelingen van vaders en de echtscheiding van ouders) hebben immers wel effecten op het verloop van de criminele levenslopen van kinderen. Een theorie als de age graded

theory of informal social control waarin ruimte is voor zowel populatieheterogeniteit als state dependence past het best bij de resultaten van dit proefschrift.

Beperkingen & verbeteringen

In vergelijking tot eerder onderzoek hebben we in dit proefschrift op verschillende gebieden vooruitgang weten te boeken. Allereerst is de data van de Criminele Carrière en Levensloop Studie veel omvangrijker dan de data gebruikt in eerder onderzoek, waardoor meer geavanceerde statistische technieken mogelijk werden. Daarnaast gebruiken we in dit onderzoek een veel langere follow-upperiode, waardoor het mogelijk is om de criminele carrières tot de leeftijd van 40 te onderzoeken. Ten derde biedt het design van de Criminele Carrière en Levensloop Studie een controle groep, waardoor het mogelijk is om de intergenerationele overdracht adequaat vast te stellen en om de effecten van bijvoorbeeld echtscheiding van de ouders te vergelijken tussen criminele en niet-criminele families. Ten vierde geeft deze studie gedetailleerde inzichten in de transmissie van veroordelingen van vaders en kinderen, maar ook in de omstandigheden die sterk samenhangen met veroordelingen van vaders: ouderlijke echtscheiding, gevangenschap van de vader en de veroordelingen van moeders en broers en zussen. Tenslotte boeken we met dit proefschrift ook vooruitgang doordat we ontwikkelingscriminologische theorieën toepassen op het gebied van de intergenerationele overdracht van veroordelingen en met het toetsen van tegengestelde theoretische verwachtingen.

Uiteraard heeft dit proefschrift ook te maken met verschillende beperkingen. De meeste beperkingen hebben te maken met het gebruik van officiële, administratieve gegevens. Aangezien we in dit onderzoek uitsluitend gebruik maken van officiële gegevens, beschikken we maar over enkele controlevariabelen. Idealiter zouden we veel meer controlevariabelen willen meenemen. Verschillende -door ons niet gemeten- factoren zoals opvoedtechnieken, buurt en gezinsstatus van invloed kunnen zijn. Een ander nadeel van de gebruikte officiële gegevens is dat onze data hoogstwaarschijnlijk een onderschatting van het werkelijke aantallen gepleegde delicten zal betreffen. Immers, veel delicten komen niet bij de politie aan het licht. Nog een nadeel van de officiële data is dat we geen beschikking hebben over gegevens over criminele gedragingen die plaatsvonden voor de 12^{e} verjaardag van de kinderen.

Een andere beperking heeft te maken met de beperkte mogelijkheid van het toetsen van de theorieën. Farrington et al (2001) onderscheiden zes mechanismen die de intergenerationele overdracht van veroordelingen zouden kunnen verklaren. Die mechanismen voorspellen allemaal een verband tussen veroordelingen van vaders en kinderen. Met de CCLS-data zijn de specifieke mechanismen echter niet te testen. Om tot

voorspellingen te komen op basis van de ontwikkelingscriminologische theorieën dienen we veel assumpties te maken. Bijvoorbeeld in hoofdstuk 4, waar we effecten vinden van de timing van de veroordelingen van vaders toetsen we hypothesen uit de differentiële associatietheorie. Het achterliggende mechanisme van deze theorie -namelijk het leren of imiteren van het gedrag- blijft ongetest.

Vervolgonderzoek

De resultaten van dit proefschrift leiden tot veel nieuwe inzichten op het gebied van intergenerationele overdracht van veroordelingen. Toch zijn er op verschillende terreinen nog verbeteringen mogelijk. Allereerst zijn er mogelijkheden voor theoretische verbetering. In dit proefschrift hanteren we een zeer nauwe interpretatie van (met name) de self control theory. Andere onderzoekers gebruiken een andere interpretatie waarin zelfcontrole gezien wordt als een functie van kansen en zelfcontrole (o.a. Grasmick, Tittle, Bursik & Arnekev, 1993; Longshore, 1998). Een dergelijke interpretatie zou bijvoorbeeld kunnen leiden tot voorspellingen over de sterkte van de intergenerationele overdracht onder verschillende omstandigheden. Een tweede suggestie om theoretische vooruitgang te boeken is om te komen tot een soort van synthese tussen de theoretische verwachtingen van de 2 theorieën: de self control theory en de age graded theory of informal social control. Sommige verwachtingen van de self control theory verkrijgen door de empirie telkens ondersteuning, terwijl andere verwachtingen steeds worden ontkracht. Hetzelfde geldt voor de verwachtingen van de dynamische theorieën. Een nieuwe geïntegreerde theorie zou recht moeten doen aan de inzichten uit het eerdere onderzoek.

Naast mogelijkheden tot theoretische verbetering hebben we verschillende andere suggesties voor toekomstig onderzoek. We stellen bijvoorbeeld voor om meer onderzoek te doen naar de mate waarin biologische factoren het verband tussen de veroordelingen van vaders en kinderen verklaren. Daarnaast zou toekomstig onderzoek zich op meer dan twee generaties kunnen richten, zoals in het onderzoek van Bijleveld & Wijkman (2009) ook gedaan is. We stellen ook voor dat toekomstige studies meer aandacht besteden aan de invloed van veroordelingen van de moeders. Tenslotte zouden er ook andere negatieve uitkomsten van de veroordelingen van de vader kunnen worden onderzocht. Daarbij denken wij bijvoorbeeld aan tienerzwangerschappen, slechte schoolresultaten en dropping out.

Meest belangrijke opdracht voor vervolgonderzoek zal zijn om de intergenerationele overdracht van veroordelingen te bestuderen met een uitgebreidere dataset dan we in dit proefschrift hebben gedaan. De huidige dataset zou moeten worden uitgebreid met allerlei informatie over de ouderlijke achtergrond,

sociaaleconomische status en opvoedstrategieën. Het uitbreiden van de Criminele Carrière en Levensloop Studie met dergelijke informatie zou de beperkingen van de huidige studie doen verdwijnen, terwijl de sterkte punten van de studie bewaard zouden blijven.

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Appendix 1 (belonging to chapter 3)

Table 3.3b: Poisson models, dependent variable number of criminal acts; parameters and standard errors

	Model 1			Model 2		
	B	sig	SE	B	sig	SE
Intercept	-3.81	***	.18	-3.81	***	.18
Age	.03	***	.00	.03	***	.00
Female	-1.62	***	.03	-1.62	***	.03
Parents divorced (ever)	.07	*	.04	.07	*	.04
Number of siblings	.18	***	.03	.18	***	.03
Control Fathers (ref model 1)				-2.13	***	.16
Sporadic Offenders	1.30	***	.15	-.83	***	.09
Low Rate Desisters (ref model 2)	2.13	***	.16			
Medium Rate Desisters	2.60	***	.19	.47	**	.15
High Rate Persisters	2.67	***	.28	.54	**	.26
Variance level 2	3.36	***	.15	3.36	***	.15
N			7987			7987
2 LL			25429			25429

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Appendix 2 (belonging to chapter 4)

Table 4.2b: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 6,921; $N_{person\text{-}years}$ = 123,630);(using lme4 in R) 2 levels and 3 levels

	Model 1			Model 2		
	B	sig	SE	B	sig	SE
Intercept	-4.43	***	.10	-4.65	***	.09
log (Age-11)	1.20	***	.04	1.21	***	.04
Log (40-Age)	.79	***	.05	.77	***	.05
Sex (female =1)	-2.21	***	.07	-1.97	***	.07
Parental divorce	.41	***	.06	.43	***	.06
Deceased Father	-.06		.07	-.09		.07
Number of children within the family	.01		.02	.02		.02
Log (total number of criminal convictions father)	.41	***	.00	.41	***	.00
Intercept variance level 2	1.64		1.28	3.37	*	1.83
Intercept variance level 3	1.44		1.20			
-2log-likelihood	-19258			-19361		

* p < 0.05 ** p < 0.01 *** p < 0.001

Table 4.2c: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 6,921; $N_{person\text{-}years}$ = 123,630); linear measurement criminal acts father

	Model 1			Model 2		
	B	sig	SE	B	sig	SE
Intercept	-9.40	***	.20	-8.92	***	.20
log (age-11)	118	***	.04	1.17	***	.04
log (40-age)	.80	***	.04	.80	***	.04
Sex (Female =1)	-2.18	***	.08	-2.16	***	.08
Parental divorce	.34	***	.06	.43	***	.06
Deceased father	.05		.07	.05		.07
Number of children within the family	.31		2.10	.49		2.07
Log (Total number of criminal convictions father)	.49	***	.03			
Total number of criminal convictions father – Linear				2.60	***	.23
Intercept variance level 2	4.09	***	.17			
-2log-likelihood (smaller is better)	37735			45859		

* p < 0.05 ** p < 0.01 *** p < 0.001

Table 4.2d: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 6,921; $N_{person\text{-}years}$ = 123,630); linear measurement decay-effect

	Model 1			Model 2		
	B	sig	SE	B	sig	SE
Intercept	-9.30	***	.30	-9.51	***	.31
log (age-11)	1,19	***	.04	1.18	***	.04
log (40-age)	.75	***	.04	.77	***	.04
Sex (Female =1)	-2.20	***	,08	-2.21	***	.10
Parental divorce	.32	***	.06	.32	***	.07
Deceased father	.13		.08	.17		.09
Number of children within the family	-.72		2.08	-.64		1.98
Log (Total number of criminal convictions father)	.40	***	.04	.40	***	.04
Learning-effect (β1)	.55	***	.12	.73	***	.07
Exp Decay-effect (β2)	6.87	**	1.93			
Linear Decay-effect (β2b)				-.27	*	.01
Intercept variance level 2	4.16	***	.17	4.16	***	
-2log-likelihood (smaller is better)	37684			37840		

* p < 0.05 ** p <0.01 *** p <0.001

Appendix 3 (belonging to chapter 6)

Table 6.3b: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 5.981; $N_{person\text{-}years}$ = 60.626) controlling only for the total number of convictions of the father

			Model 2b				Model 4b			
			B		SE	(exp)B	B		SE	(exp)B
Constant			-3.10	**	.14		-3.08	**	.14	
Personal Characteristics										
Female			-1.66	**	.04	.19	-1.66	**	.04	.19
Log (age-18)			.09	**	.04	1.09	.09	**	.04	1.09
Log (30- age)			.18	**	.04	1.20	.18	**	.04	1.20
Timing of fathers' imprisonment										
Before birth	0-12	12-18								
No	no	no (ref)								
No	yes	No	.41	**	.05	1.51				
No	no	Yes	.21		.15	1.23				
No	yes	Yes	.19		.10	1.21				
Yes	no	No	.22		.16	1.25				
Yes	yes	No	.43	**	.08	1.54				
Yes	no	Yes	.48		.29	1.62				
Yes	yes	Yes	.11		.09	1.11				
0 days (ref)										
1-30 days							.38	**	.05	1.46
30-180 days							.25		.14	1.28
180-360 days							.19		.10	1.22
More than 360 days							.27	**	.06	1.31
Total number of convictions										
At age child: before birth			.04	**	.01	1.04	.05	**	.01	1.05
At age child : 0-12			.10	**	.01	1.10	.10	**	.01	1.10
At age child: 12-18			.09	**	.02	1.09	.08	**	.02	1.08
Intercept variance Level 2			1.09	**	.01	1.01	.99	**	.01	
Intercept variance Level 3			2.75	**	.03	2.70	2.68	**	.03	

* p < 0.05 ** p <0.01

Table 6.3c: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 5.981; $N_{person\text{-}years}$ = 60.626); interactions timing and sex of the child

			Model 2c		
			B	SE	Exp (B)
Constant			-2.87 *	.14	.06
Personal Characteristics					
Female			-1.77 **	.04	.17
Log (age-18)			.09 **	.04	1.09
Log (30- age)			.18 *	.08	1.18
Timing of fathers' imprisonment					
Before birth	0-12	12-18			
No	No	no (ref)			
No	Yes	No	.62 **	.05	1.86
No	No	Yes	.47 **	.07	1.60
No	Yes	Yes	1.02 **	.06	2.80
Yes	No	No	.41 **	.08	1.51
Yes	Yes	No	.90 **	.08	2.45
Yes	No	Yes	.77	.34	2.17
Yes	Yes	Yes	.76 **	.08	2.15
*Timing of fathers' imprisonment * female*					
Before birth	0-12	12-18			
No	No	no (ref)			
No	Yes	No	.34	.19	1.41
No	No	Yes	.42	.26	1.52
No	Yes	Yes	.02	.14	1.02
Yes	No	No	-.05	.21	.95
Yes	Yes	No	.22	.18	1.24
Yes	No	Yes	.54	.49	1.71
Yes	Yes	Yes	.62	.37	1.87
Intercept variance Level 2			1.08 **	.01	
Intercept variance Level 3			2.73 **	.03	

* $p < 0.05$ ** $p < 0.01$

Table 6.3d: Multilevel logistic regression models of criminal conviction in a certain year (N_{person} = 5.981; $N_{person\text{-}years}$ = 60.626); interactions duration and sex of the child

	Model 4d			
	B		SE	(exp)B
Constant	-2.80	**	.14	
Personal Characteristics				
Female	-1.83	**	.06	.16
Log (age-18)	.08	*	.04	1.08
Log (30- age)	.19	**	.04	1.21
Total length fathers' imprisonment				
0 days (ref)				
1-30 days	.54	**	.06	1.71
30-180 days	.75	**	.06	2.12
180-360 days	.65	**	.05	1.92
More than 360 days	.80	**	.05	2.23
*Total length fathers' imprisonment * female*				
0 days (ref) * female				
1-30 days * female	.17		.13	1.18
30-180 days * female	.41	*	.13	1.51
180-360 days * female	.39	**	.16	1.48
More than 360 days * female	.37	**	.16	1.45
Intercept variance Level 2	1.05	**	.01	
Intercept variance Level 3	2.67	**	.02	

* p < 0.05 ** p <0.01

Curriculum Vitae

Marieke van de Rakt was born on April 11th 1981 in Nijmegen, the Netherlands. She completed her secondary education at Maaswaal College in Wijchen in 1999. From 1999 to 2004, she studied sociology and communication sciences at the Radboud University in Nijmegen. During her studies, she did a traineeship at the NSCR (Netherlands institute for the Study of Crime and Law Enforcement). After receiving her Master's degree in Sociology cum laude in 2004, she became a PhD candidate at the Interuniversity Center for Social Science Theory and Methodology (ICS) and the Department of Sociology at the Radboud University Nijmegen. There she worked on a project subsidized by the Netherlands Organization for Scientific Research (NWO), which resulted in this book. For several years, she was also involved as a teacher in different courses including courses in criminology. The main focus and interest of her research is in criminology.

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